MILL SECTION of

Concrete

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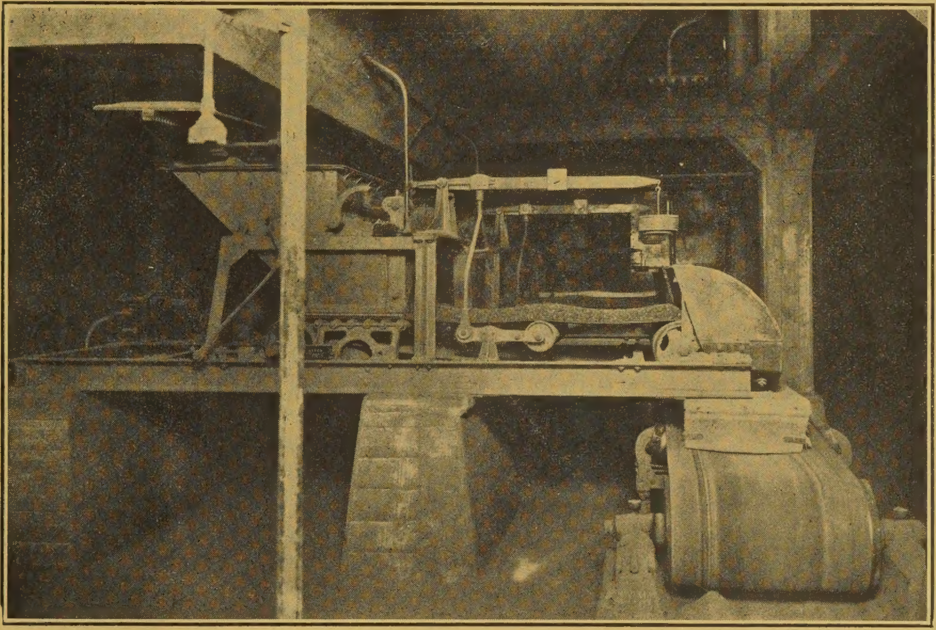

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MILL SECTION of
Concrete

The Cement Mill Edition of Concrete is edited exclusively for those interested in the manufacture of cement. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.

The Cement Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition. The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.

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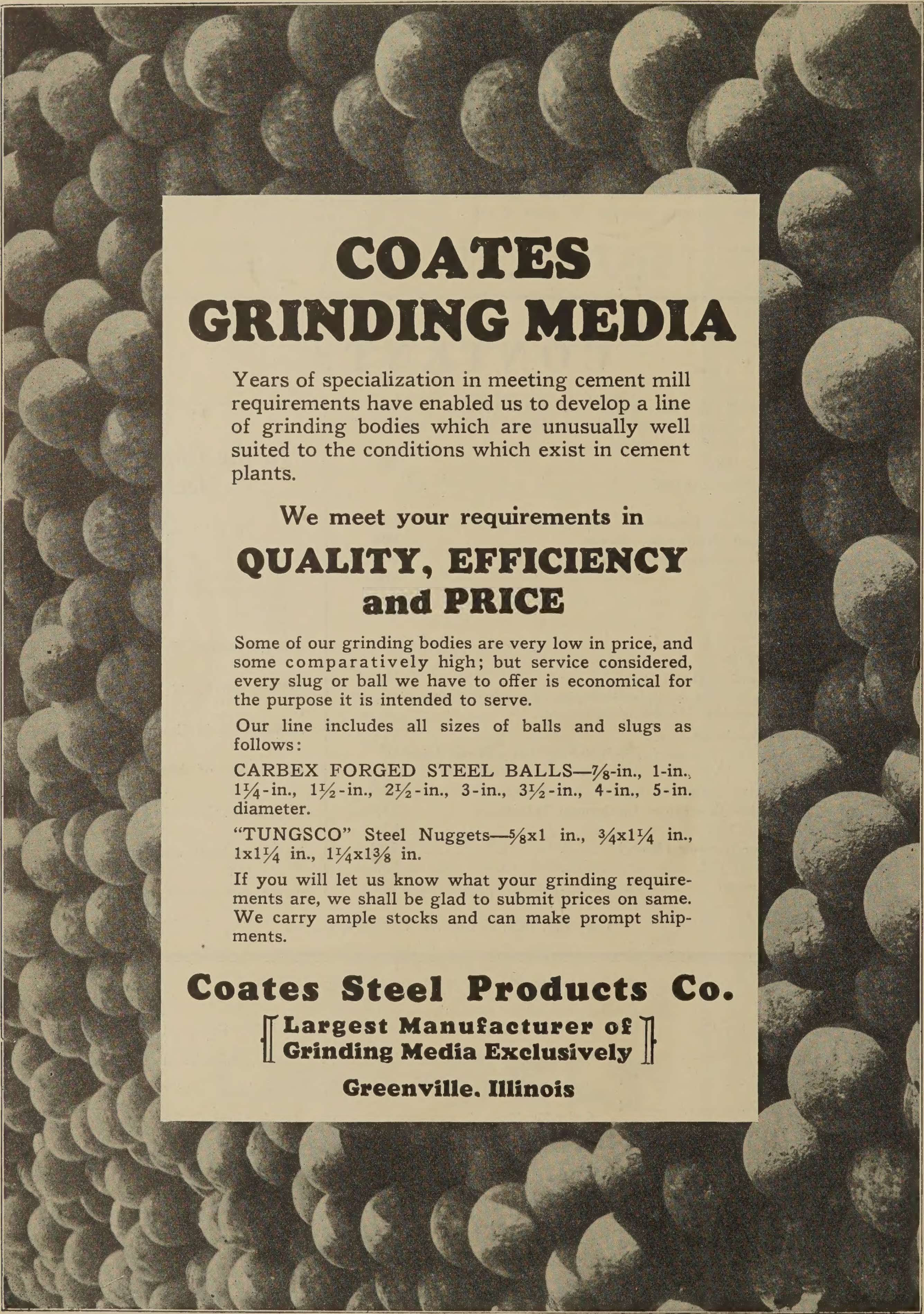

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MILL SECTION of

Concrete

Vol. 35 Chicago, December, 1929 No. 6

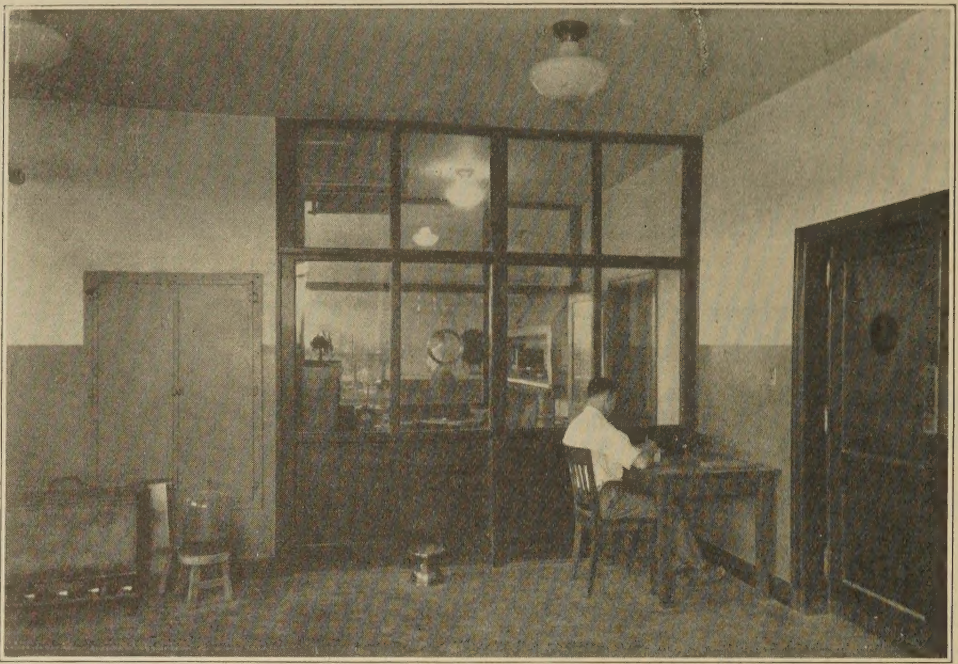
The New Laboratory
of the
Valley Forge Cement Company

Modern Laboratory Designed and Equipped to Secure Accuracy in Testing Serves Eastern Cement Plant

By W. H. ANDREWS
Supervising Chemist, Valley Forge Cement Co.

THE laboratory of the Valley Forge Cement Company at West Conshohocken, Pa., presents a number of features of interest to chemists and the cement industry in general. It was designed and arranged with the thought of convenience and is complete in most details that are considered necessary to make possible accurate analytical

The reinforced concrete laboratory and office building of the Valley Forge Cement Company at West Conshohocken, Pa,



Looking from the physical laboratory through the chief chemist's office to the chemical laboratory at the Pennsylvania plant

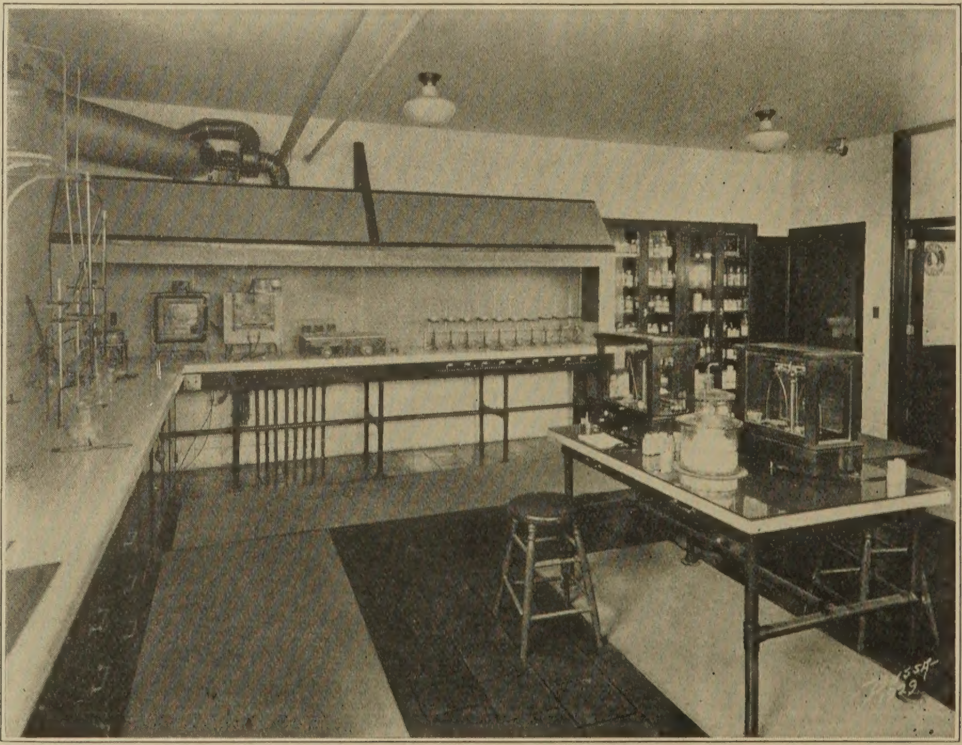
work as well as uniform physical testing. The equipment was given very careful consideration and all apparatus was chosen with regard to its reliability and accuracy.

The building is of concrete construction with cement shingle roof. It is conveniently placed in regard to sampling, being nearly equidistant from kilns, mill room, coal grinding department and slurry tanks.

The entrance is through a hall 8 ft. wide leading directly to the chief chemist's office, which is a glass enclosure affording a view on three sides of both the chemical and physical departments. A door leads from the chief chemist's office into the chemical laboratory, but the side toward the physical laboratory is glassed off completely. Necessary communication is carried on through a small aperture. This arrangement cuts off the physical side entirely from the chemical and reduces the chance of dirt and dust entering the chemical side.

Chemical Room

The chemical room is 23 ft. by 23 ft. in size with a wall table on three sides of the room. The furniture is by the Laboratory Furniture Company of Long Island City, New



The Valley Forge physical laboratory, having a wall table on three sides

York, the drawers being on ball bearings. The table tops are of white glazed tile. Features of particular interest are, first, the walls which are of white-cement asbestos wall tile and second, the floors which are of cement-asbestos lumber, cut in tile form and colored red. Both the above products are manufactured by the Keasbey-Mattison Company. The hood is also of asbestos lumber, being fabricated from Transite made by the Johns-Manville Company.

Another view of the chemical laboratory, whose equipment is described below

The balance table is supported by heavy pipe supports, and is of alberene stone on which is laid a layer of felt covered with plate glass. The balance table is so placed and the balances so arranged that weighing can be carried on from two sides. The hot air and gases from the hood are exhausted by a motor driven fan and are discharged into a large flue. A large metal cabinet with glass doors, serves as a container for the supply of chemicals. When not in use all chemicals and apparatus are removed from the desk tops and placed in the drawers and enclosed compartments.

The sink and drain boards are of slate with water taps of chrome nickel. The lighting is of the indirect type, affording uniform vision in all parts of the room.

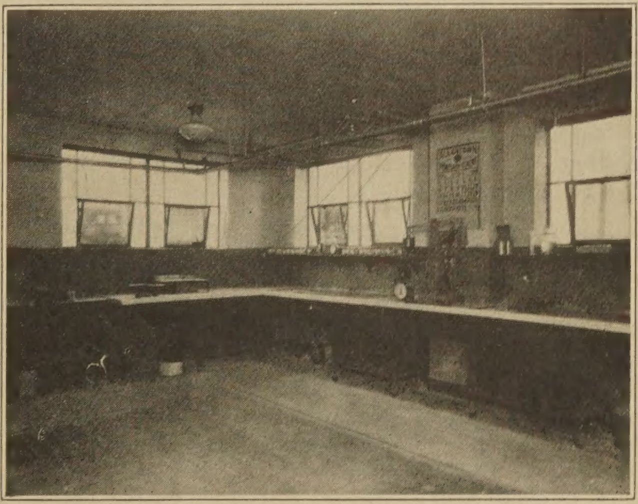
Physical Testing Rooms

The physical testing department consists of two rooms, with swinging doors between. One room, 23 ft. by 19 ft. in size, has wall tables on two sides. This room is used for briquette, pat and cylinder making and for the drying and preparing of the slurry for testing. The work desks are topped with sections of heavy plate glass on which the mortar for test pieces is mixed and molded. These glass insets are surrounded with white glazed tile. In this room are also the boiler for the steam test, the moist cabinet, the breaking machine, and large hot plates for drying the slurry samples.

The moist cabinet is of alberene stone with felt curtain in rear of all compartments over which is thrown a constant spray of 70 deg. water regulated by a Powers thermostatic water controller. Fineness determinations are made in a soundproof compartment which houses the fineness balances and rotap machine.

Machinery Room

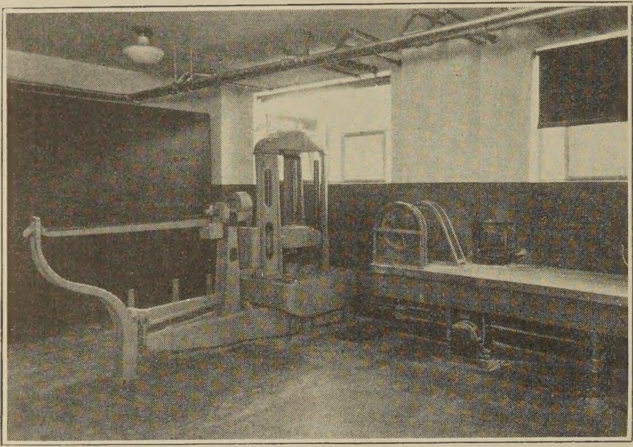
The second physical testing room contains the grinding and crushing machinery, also a 200,000 lb. Riehle Brothers, three-screw compression machine. The briquette tanks are of slate and fitted with outlets so that they can be easily cleaned.



A corner of the physical laboratory at the West Conshohocken plant

Another feature of interest is the toilet and locker room. This room contains shower stalls, wash basins, toilets and lockers. The floors, walls and shower enclosures are of cement tile. It is reached from the main hall and is easily accessible from all departments.

The revised standard specifications for portland cement call for increased strength and a uniform high quality product at all times. The new requirements not only necessitate improved methods and added care in the manufacturing process, but eternal vigilance and uniform interpretation and execution of the methods of sampling and testing must be closely followed, if results obtained by the many laboratories engaged in this work are to be compared.



Other equipment of the physical laboratory

These factors, together with the pre-testing by the user of a large percentage of cement shipments, fully justify the detailed attention given to the design and equipment of the above described cement plant laboratory.

The laboratory has been inspected by a representative of the Cement Reference Laboratory of Washington, and the different machines have been calibrated and the methods used have been observed and criticized. The molds, breaking machines, steam boilers, balances, etc., carry the stamp of this reference laboratory.

Cement manufacturers recognize the constantly increasing importance of proper supervision in this particular branch of the business and for that reason maintain a trained force in the chemical and physical departments—men qualified to accurately conduct analyses and tests in accordance with the prescribed standard specifications. The laboratory is in charge of M. D. Olver, chief chemist. Walter Heck is first assistant chemist and Wm. McKeever is analyst. The physical work is supervised by James Mellon.

Soviet Awards Contract for Four Cement Plants to Chicago Firm

The soviet government of Russia on November 11th awarded a contract for the construction of four cement plants of modern design to the MacDonald Engineering Company of Chicago, Illinois. Several million dollars worth of American machinery will be used. The plants will increase the present yearly Russian output of 15,000,000 barrels to 21,000,000.

One plant will be located at Kertch on the Black sea, where Gen. Wrangel's anti-revolutionary troops were driven out of Russia by a Red army. Another will be at Spartak, 75 miles from Moscow; a third at Kashira, 130 miles from Moscow, and the fourth east of the Ural mountains.

Under the terms of the contract, which runs for three years, one plant will be equipped entirely with American machinery. If this machinery proves more efficient than European machinery, American equipment will be used entirely in the erection of the three other plants.

The amount of the contract is placed at $110,000,000. In addition to cement plants, it provides for the construction of grain elevators, flour mills, and other industrial developments. The company will be paid on a cost basis plus a fixed fee that is said to be the largest ever paid by the soviet government. Payments will be made in dollars through the Chase National bank of New York periodically. The company will have its headquarters in Moscow, with Vice President Carter in charge.

J. B. John Named Head of New Medusa-Newaygo-Manitowoc Company

Following the consolidation of the Newaygo Portland Cement Company of Michigan and the Manitowoc Portland Cement Company of Wisconsin with the Medusa Portland Cement Company, Cleveland, Ohio, J. B. John was elected president on October 23rd.

Officers named in addition to President John include E. J. Maguire, vice president and treasurer; Charles C. West, vice president; W. B. Newberry, assistant general manager; P. G. Dawson, secretary; Frederic Pickford, assistant secretary; Henry Jeavons, assistant treasurer.

Directors of the combined companies include Alva Bradley, A. C. Dustin, E. B. Greene, E. S. Hanson, W. G. Mather, J. B. John, E. J. Maguire and W. B. Newberry, Cleveland; Charles C. West, former president of the Manitowoc Cement Co., Manitowoc, Wis.; L. E. Geer, vice president and treasurer of the same company; Dan P. Eells, vice president of the Bucyrus-Erie Co., South Milwaukee, Wis.

Penn-Dixie Sales Increase; Price Reductions Lower Earnings

The report of the Pennsylvania-Dixie Cement Corporation and subsidiaries for the twelve months ended September 30th, shows a consolidated net profit of $686,072 after depreciation, depletion, interest and federal taxes, equivalent to $5.05 a share on 135,888 shares of 7 per cent preferred stock.

According to company officials there has been an increase in sales volume recently, but continued price reductions by competing companies has seriously affected earnings. Prices in the East were recently reduced 20 to 30 cents a barrel, and in the Midwest 25 to 30 cents. During the 12 months reported, prices have been reduced 25 cents a barrel in the Southwest.

At the close of the period, the Penn-Dixie ratio of current assets to current liabilities stood at 11 to 1.

Atlas Buys Minnesota Farm Land for New Plant

The Atlas Portland Cement Company on November 2nd completed the purchase of over 1200 acres of Minnesota farm land on which a plant for the manufacture of portland cement will be erected. The acreage comprises eight farms near Rochester and the small town of Chester, on Chicago and North Western Railroad right-of-way. The purchase price is placed at about $100,000.

One and one-half million dollars will be expended in the construction of a plant which will have a daily output of 2,500 barrels of cement. About 400 workmen will be employed.

Efficiency of a Tube Mill

A Report of Some Researches Made to Determine the Action of Tube Mill Charges

By DIPL.-ING. OESTERLIN

IN an article entitled "Contribution to the Tube Mill Theory," which appeared in *Zement* dated March 14, No. 11, Naske seeks to prove that the generally accepted theory of the grinding process inside a tube mill does not correspond with reality. The proof lies in that the difference between the theoretically computed and the actual power consumption—taking into account the friction—is so great that the surplus power of some 190 per cent can only be accounted for by refuting the old theory of the grinding process in part or in toto. The fundamental principle of the latter is that disintegration of the rock inside the mill is accomplished only by the "inclined" impact. This basic idea is entirely correct. Practical experience also shows that not only the impact, but the friction as well is instrumental in this disintegration and that the effect of the latter is increased with increasing fineness. Unfortunately, in his purely theoretical discussion, Naske starts out with some erroneous assumptions which work to confuse the final result.

Work Performed in Tube Mills

Nilsson correctly states that the mill does two kinds of work: first, the lifting of a certain charge of balls with the angular velocity of the mill up to the release of the charge due to rotation of the mill and its free fall; second, the accelerating of the dropped balls until they acquire the angular velocity of the mill and move upwards.

A third kind of work, not mentioned by Nilsson, is the destruction of the velocity of the ascending charge, wherever it has a component directed against the rotation of the drum. This work may be neglected for it is not only slight, but because the various components tend to neutralize one another. In this connection the correct computation of the impact of the dropping charge may be discussed.

As the total work performed by the tube mill—disregarding friction—consists only of the lifting and accelerating work, it appears unnecessary to decide on the correct computation of the shock, since the computation of the work of lifting is so much simpler. At the moment when a ball is lifted high enough to assume the course of free fall, the work required is completed and the power consumption remains unaffected by considerations of whether we deal with elastic or inelastic impact, straight or inclined, centrally or eccentrically applied. The nature of the shock may have an effect of the third class of work, but, as mentioned above, it is slight and can be neglected.

The friction between the charge units and between these and the walls of the mill, as well as the nature of the material to be ground have an important effect on the process of grinding. It is well known that cylpebs have an entirely different action on a hardened steel lining, which after a short period of grinding shows a relatively low coefficient of friction, than on a silex lining. These varying conditions of friction become manifest in the number of balls carried upwards per revolution of the mill.

The depth of load in a mill is also of influence, as with increasing depth, the friction of the lowest layers of the charge is increased. Thus, in summarizing, one may say that: the number of balls carried away and discharged as free falling bodies per revolution of the mill depends on the r.p.m. of the mill; on the nature of the mill lining; on the nature of the charge; on the amount of load; on the coefficients of friction between lining and charge and between the charge units and, finally, on the nature of the material to be ground.

In observing the operation of a tube mill, specially adjusted for such observations, one becomes aware of a condition which is of utmost importance in the attempt to compute the required power; namely, that a certain number of balls upon dropping down do not immediately acquire the angular velocity of the mill, but remain at the foot of the parabolic curves of their free fall, being apparently tossed around following no fixed law, until in accordance with the conditions enumerated above (particularly the friction between the lining and the charge), they gain the velocity of the mill. It may be observed further that the inner layers of the charge slide off one another and off balls of other layers, so that they are not completely lifted by the mill rotation and discharged into space. Depending upon the lining, the revolutions per minute and the nature of the material to be ground, the entire ascending charge is sometimes observed to drop, producing a noise familiar to any operator.

Classification of Charge Units

Classifying the above information, the charge units of a rotating tube mill may be divided as follows:

Group 1: The charge units ascending with the angular velocity of the mill, which may slide off under special conditions.

Group 2: The charge units dropping as free falling bodies.

Group 3: The charge units moving about irregularly at the foot of the parabola of free fall; these have not yet acquired the velocity of the mill.

Group 4: The charge units rolling off the inner layers.

The balls of groups 1 and 2 must be identical in number and weight. The number of balls in group 3 depends upon friction and nature of the lining. The number of balls in group 4 may become equal to zero. These observations and conclusions show definitely that a computation of power required based on charge units in groups 1 and 2 alone—i. e., an ideal condition—cannot be expected to correspond to a practically obtained value.

Let us study the distribution of the balls in groups 1 to 4 in the tube mill under observation. Naske assumes that all balls make one complete revolution per revolution of the mill. This would do away with groups 2, 3 and 4, leaving the balls apparently stuck to the lining; no free fall could be imagined under such conditions. Therefore, his computations cannot be correct.

On the other hand, Nilsson in his basically correct

Translated from *Zement*.

analysis determines with the aid of a graphic method the number of balls making up the ascending charge and allows them to be carried upwards with each revolution of the mill. He takes twice that number of balls for the work of acceleration. To this work performed he adds the percentage of 2000 kg. material, which he assumes fed to the mill.

One may note that the quantity of material of 2000 kg. fed into a tube mill is excessive for a 6750 kg. charge; 1100 kg. material would be a more reasonable figure. Also it is impossible to imagine that the number of balls making up the ascending current at any moment is repeated with every revolution of the mill. This is an error, to which Nilsson himself refers in part. Also the number of accelerated and lifted balls must naturally be the same, as theoretically only the accelerated balls can be lifted at all. In view of these erroneous assumptions the fine agreement obtained between theory and practice in this case must be considered accidental.

Observations show that some of the balls in group 1 make as many as 2 revolutions per mill revolution. On the average these balls are lifted between 1 and 2 times per mill revolution. The exact number can be established by such observations.

Layers of Charge Units

Considering the ascending and falling balls at any one moment, we find that, according to Nilsson, 23 balls move along the periphery of the drum, i. e., in the outer layer of the charge; the next layer contains 21, to which 10 and 9 balls correspond in the respective curves of free drop. This leaves about 7 balls, which Nilsson distributes by locating 5 in the ascending charge and placing 2 on the free drop curve. In attempting to construct a diagram for any given moment, one can get along with 18 balls in the second layer, while a complete third layer would take about 14 balls. It becomes obvious that this example of a mill using 6750 kg. balls is not favorable for purposes of computation. Whether one figures with Nilsson, assuming (23 + 10) + (21 + 9) + 7 balls or, as appears more rational in the author's opinion, assuming (23 + 10) + (18 + 8) + 11 balls, there remains an insufficient number for a complete third layer. Therefore, one cannot assume a general diagrammatic view showing an inner layer with (5 + 2) or (8 + 3) balls, for, while this may occur, it does not represent the average condition, which may form the basis of a computation. The end is more nearly approached, if, instead of a complete third layer, one deals with 8/14 of a layer. The movement of the balls can then be assumed to take place as follows:

A diagram of group 1 shows a "strip" in the longitudinal direction of the mill which contains 96 balls. 2 8/14 = 2.57 ball layers contain 2.57 × 96 = 246 balls. As these 246 balls have the angular velocity of the mill, the path of these three "strips" of balls, measured along the average diameter $\pi \times (1000 - 3 \times 62.5) \times 34 = \pi \times 812.5 \times 34$ mm. per minute. This path is traversed per minute by

$$\frac{\pi \times 812.5 \times 34}{62.5}$$

ball strips. Therefore the number of balls carried upwards per minute is:

$$\frac{246 \times \pi \times 812.5 \times 34}{62.5} = 340{,}000 \text{ balls}$$

However, the mill contains only 6750 balls. These must, therefore, be lifted an average number of times per minute equal to 340,000 ÷ 6750 = 50.5 times. Reduced to the number of revolutions per minute made by the mill itself, the balls are accelerated and carried upwards 50.5 ÷ 34 = 1.48 times per mill revolution.

Working Weight of the Charge

In a further consideration of the work performed in lifting the balls, one must note, contrary to Nilsson, that the working height is not that from the center of the lowest ball to the center of the upper ball along the corresponding curve, but that it must be measured from the center of the ball hitting the wall of the drum or the adjoining layer to the center of the ball in the corresponding path curve at the moment when it leaves the wall of the drum or the adjoining layer. This distance is equal to about 0.705 m. in the outer layer; to about 0.59 in the next and to about 0.49 m. in the inner layer. As not only the balls of group 1 are lifted 50.5 times per minute, but the balls of the entire charge go through the same movement, the work performed may be expressed as follows:

1st layer: (23 + 10) × 0.705 = 23.3 m.kg.
2nd layer: (18 + 8) × 0.59 = 15.3 m.kg.
3rd layer: 8/14 (8 + 3) × 0.49 = 3.1 m.kg.
A vertical layer performs = 41.7 m.kg.

The work throughout the mill is 96 × 41.7 = 4000 m.kg. or

$$\frac{4000 \times 50.5}{60 \times 75} = 45 \text{ hp.}$$

The work of lifting the material is:

$$\frac{45 \times 1100}{6750} = 7.3 \text{ hp.}$$

The total work of lifting is 52.3 hp.

In computing the work of accelerating, the author assumes the peripheral velocities assumed by Nilsson and obtains:

1st layer:

$$\frac{23 + 10}{g} \times \frac{1.667^2}{2} = 4.68 \text{ m.kg.}$$

2nd layer:

$$\frac{18 + 8}{g} \times \frac{1.55^2}{2} = 3.19 \text{ m.kg.}$$

3rd layer: 8/14

$$\frac{8 + 3}{g} \times \frac{1.445^2}{2} = 0.67 \text{ m.kg.}$$

A vertical layer performs = 8.54 m.kg.

The work of the mill is 96 × 8.54 = 820 m.kg. or

$$\frac{820 \times 50.5}{60 \times 75} = 9.2 \text{ hp.}$$

The corresponding work for the material used is:

$$\frac{9.2 \times 1100}{6750} = 1.5 \text{ hp.}$$

The total work of accelerating is 10.7 hp.

Total Power Required

The total power required by the mill—disregarding friction—is thus 63 hp. According to Naske's measurements the mill requires 55 — 8 = 47 hp. operating without friction. The computed value thus shows a surplus power of 16 hp. or 34 per cent. The ratio of computed accelerating to computed lifting is 10.7 : 52.3 = 1: 4.9. The result obtained shows that the movement of the charge inside the mill in question cannot conform to the diagram discussed, but must assume other courses. It is probable that the number of balls acquiring velocity is greater than that of the balls reaching the point where free fall begins, but that the average final velocity of the accelerated balls is considerably below the angular velocity of the mill drum. The total work of lifting is, therefore, less, yet a certain number of balls fall in groups 3 and 4 and must be considered. The exact nature of these relations and the distribution cannot be determined analytically. An analytic determination only goes to prove that within the mill in question one deals not only with a free fall but with a sliding and rolling action as well.

The author agrees wholeheartedly with Naske, who quotes Dr. Goslich's statement in his reply article in No. 18 of *Zement* of May 2nd, in saying that a well planned experiment is of greater value than the most elaborately worked out formula. This statement is particularly adapted to the field of rock grinding, where the practice still presents amazing results upsetting all theories. On the other hand, it is frequently the case that the nature of progress achieved by the cut-and-try method becomes understood only at a later date through analytical studies, which help readjust practical conditions after they have assumed an erroneous course. Computations of the power consumption of a tube mill cannot be made at a desk alone. If they are to be of any use, these computations should go hand in hand with direct observations. It is, therefore, to be hoped that the studies of tube mills announced by Naske will greatly extend our knowledge of their performance. This seems the more desirable, as it will enable a buyer to form a better judgment of the service of a mill and will prevent unscrupulous dealers from offering guarantees beyond reason.

Native Buying Power Limits Bolivian Market for U. S. Cement

Large Indian Population Is Factor—Unstable Business Conditions Permit Little Construction, with Consequent Small Demand for Local and European Cement

ESTIMATES place the annual consumption of cement in Bolivia at about 50,000 barrels. Aside from the more important cities, buildings are made of adobe or mud brick which are reinforced and covered with plaster. It is used in small amounts for sidewalks and paving in the larger cities of the republic, the Special Cement Bulletin of the Department of Commerce states.

In February, 1928, a cement plant located at Viacha, about 30 kilometers from La Paz, began operations. At present the plant is producing about 4,500 barrels of cement a month and it is anticipated that this will be increased to 6,000 barrels. The company has the privilege of importing free of duty, petroleum and sacks for a period of five years and, further, the right to request from the government an increase of 10 per cent in the duties on imported cement. In return for these privileges the company is required to sell cement to the government at a 10 per cent discount.

Business conditions in Bolivia have not been generally satisfactory for some time with the result that there has been little activity in the building trades requiring cement. The Bolivian market is limited in normal times by the fact that 80 per cent of the total population consists of Indians having an extremely limited purchasing power.

Cement is imported into the country from Great Britain, Yugoslavia, Belgium and Germany; and much of that from Belgium and Yugoslavia is natural cement. The Viacha mill referred to above naturally has little trouble in underselling even the cheapest grade of European cement. Consequently due to its relatively high price, cement imported from the United States is limited. The following table lists the imports of cement into Bolivia and indicates clearly the foregoing. Statistics for 1928 are not yet available.

	1926		1927	
Country	Bbls.	Value	Bbls.	Value
Great Britain	22,811	45,784	23,786	49,674
Belgium	9,257	20,729	9,592	22,036
Germany	5,943	10,797	6,972	11,898
Chile	1,540	6,212	1,816	4,991
Denmark	3,635	5,917	2,067	3,551
Netherlands	1,896	4,572	276	626
United States	857	3,619	2,014	4,203
Argentina	300	1,610	539	2,794
Brazil	155	1,604	230	2,205
Yugoslavia	118	379	14,278	44,934
Other countries	266	693	177	660
Total	46,786	101,916	61,747	147,572

Prices of the cement produced by the plant at Viacha are Bs. 19.25 (about $6.93 U. S. currency) per barrel, weighing 376 pounds f.o.b. Viacha for large orders. Retail prices were raised on August 1, 1929, from Bs. 21.00 (about $7.56 U. S. currency) to Bs. 23.50 (about $8.45 U. S. currency). The average grade of imported cement sells for about Bs. 32.00 per barrel (or about $11.52 U. S. currency), hence it can readily be seen that the foreign product competes with difficulty with the Viacha cement. It is probable, therefore, that foreign cement will practically be shut out of this market as soon as the local plant is able to supply Bolivia's entire demands.

Import duty on cement is one of Boliviano per gross 100 kilos or approximately $0.36 U. S. currency (as of rate of exchange August 20, 1929). Other shipping costs are a consular invoice fee of 6 per cent of the value of the shipment, a municipal surcharge of 20 per cent, computed on the value of other duties, and several other imposts.

P. C. A. Holds Annual Meeting at Chicago

Matters of importance from a marketing point of view occupied the attention of cement manufacturers during the Twenty-Seventh Annual Meeting of the Portland Cement Association, held at the Blackstone Hotel, Chicago, November 18th, 19th and 20th.

As usual, one of the days was devoted to committee meetings, one to the business session of the association and the third to a discussion of cement mill operating problems.

At the mill session the reports of the Committee on Accident Prevention and Insurance, and the Committee on Technical Problems were presented and the following papers were read:

"Relative Operating Costs with Waste Heat and Purchased Power" by S. S. Porter, vice president and general manager, North American Cement Corp., Albany, N. Y. "Locomotive Haulage in Cement Mill Quarries" by S. H. Legate, Superintendent, Canada Cement Co., Ltd., Belleville, Ontario. "Aerial Tramway of Superior Portland Cement, Inc." by H. A. Ambler, superintendent, Superior Portland Cement, Inc., Concrete, Wash. "Electrical Haulage Operated by Remote Control" by A. C. Butterworth, electrical engineer, mining department, Pickands, Mather & Co., Duluth, Minn.

Frank H. Smith was re-elected to the presidency. Mr. Smith is president of the Lawrence Portland Cement Company.

Other officers elected for the coming year are as follows: First vice-president, Charles L. Hogan (International Cement Corporation); second vice-president, Blaine S. Smith (Pennsylvania-Dixie Cement Corporation); treasurer, C. E. Ulrickson (Trinity Portland Cement Company).

Directors, to serve three years: J. B. John (Medusa Portland Cement Company); D. H. MacFarland (Atlas Portland Cement Company); Charles Schmutz (Bessemer Cement Corporation); John L. Senior (Consolidated Cement Corporation); and F. E. Tyler (Dewey Portland Cement Company).

New Chimney Under Way

Construction is under way on a new chimney at the Medusa Cement Company plant east of Dixon, Ill. The chimney will be 300 ft. high, have an inside diameter of 16 ft. and the smoke pipe into it will be 8 ft. in diameter and 26 ft. long.

Bessemer Securities to Issue More Stock

Bessemer Securities Co., the holding concern of the Bessemer Limestone & Cement Co., the Federal Portland Cement Co. of Buffalo and the Peerless Egyptian Cement Co. of Detroit is offering shareholders 20,000 shares of additional common stock at $30 a share on the basis of one share of additional stock for eight now held. The new stock will be issued Jan. 1, 1930.

The company now has 150,000 shares outstanding and the new issue will bring the number up to 170,000 of the original capital authorization of 200,000 shares.

Proceeds of the stock sale will be used for paying off bank indebtedness and to reimburse the treasury for purchases made lately.

The company also has an option on 10 per cent of the outstanding stock of the Cold Metal Process Co., which owns and is exploiting the Steckel process for cold rolling steel and other metals.

Government Figures on Imported Cement

According to statistics just released by the Bureau of Foreign and Domestic Commerce, Department of Commerce, imports of Roman, portland and other hydraulic cement by countries of origin are as given below. These figures include free and dutiable cement as of September and for the year.

Imports Cement	1929 Bbls.	1929 Value	1928 Bbls.	1928 Value	Per Cent 1929 over or under 1928	
September	112,372	$ 152,239	173,439	$ 226,295	—35	—33
9 months	1,314,408	1,575,794	1,889,914	2,540,919	—27	—38

Countries of Origin and Customs Districts of Entry	September, 1929 Bbls.	September, 1929 Value	9 months, 1929 Bbls.	9 months, 1929 Value
Belgium				
San Antonio			9,920	$ 10,832
Connecticut			3,000	3,094
Oregon	4,395	$ 5,696	28,479	34,608
Massachusetts	47,498	58,456	249,306	314,556
Rhode Island			35,750	45,105
New York	5,000	5,895	73,223	91,161
North Carolina			38,495	47,879
Porto Rico	14,002	22,466	23,798	42,792
South Carolina			63,245	77,899
Florida	4,500	5,208	15,750	17,188
New Orleans			34,509	42,531
Sabine			5,500	8,988
Galveston			14,400	21,297
Los Angeles			295,573	160,805
Washington	1,000	1,410	1,250	1,723
Hawaii			100	212
Philadelphia	4,800	6,030	55,729	77,905
Total	81,195	$105,161	947,927	$998,565
Denmark				
Massachusetts			6,000	6,300
New York			74,577	90,456
Porto Rico	6,149	3,989	192,538	258,831
Total	6,149	$ 8,988	273,115	$345,587
United Kingdom				
New York	22,756	33,551	109,047	160,957
Philadelphia			9,981	12,764
Virginia			3,017	3,290
Los Angeles			500	809
Total	22,756	$ 33,551	122,545	$177,810

Countries of Origin and Customs Districts of Entry	September, 1929 Bbls.	September, 1929 Value	9 months, 1929 Bbls.	9 months, 1929 Value
France				
New York	1,000	$ 2,022	3,019	$ 6,226
San Francisco			667	1,783
Massachusetts			739	1,523
Total	1,000	$ 2,022	4,425	$ 9,532
Norway				
San Francisco			7,750	8,525
Porto Rico			2,700	3,671
Total			10,450	$ 12,196
Sweden				
New York			88	517
San Francisco			51	56
Total			139	$ 573
Canada				
Maine, New Hampshire	332	$ 763	4,226	9,698
Alaska			8	36
Total	322	$ 763	4,234	$ 9,734
Germany				
Los Angeles	950	1,754	11,325	21,311
San Francisco			248	486
Total	950	$ 1,754	11,573	$ 21,797
Grand Total	112,372	$152,239	1,374,408	$1,575,794

~~ EDITORIAL ~~

A Way Out

WHENEVER an individual or an industry is confronted with a particularly difficult problem, there is encouragement in the reflection that other individuals and other industries have faced the same or similar problems and have triumphed over them.

It cannot be denied that the cement industry is now facing some very difficult problems. But they are not unique. Other industries have faced them and found the way out. The cement industry is not in a more difficult situation than many other industries have been. Many allied industries in the construction field have met and overcome the same destructive influences that are now causing anxiety among cement manufacturers. The experiences of these industries may carry some constructive suggestions.

The Federal Trade Commission has been influential in correcting the harmful practices that have caused hardships in other industries. But the Federal Trade Commission can do little unless there has previously been concerted action within the industry itself in preparation for the assistance of the Commission.

Such industries as have discussed their problems constructively and then arrived at a unified definite program of action have found that the co-operation of the Federal Trade Commission has yielded definitely helpful results. To be most effective, such action should be initiated by a fairly complete representation of the industry.

There is urgent need in the cement industry for such action. Whether it be inaugurated under the present co-operative organization or by some newer organization, the effort will be more helpful if all manufacturers will actively participate.

Dust

EVEN though research over a long period of time has shown that cement dust is not harmful to workers and to people living near cement plants, it is an unnecessary nuisance. Aside from the operation advantages in reducing equipment maintenance and increasing safety in the plant, an investment in dust collection equipment is good business from the standpoint of the attitude of the workers and the good will of the public.

There is no longer any need for a cement plant to be dusty or dirty. Dust collection equipment can be and is constantly being installed in the older plants with very satisfactory results. In the newer plants it has become one of the first requirements that the plant be free from dust. In fact, one of the fairly recent plants boasted that a visitor could go through the entire plant from crusher to sacking department without dimming the polish on his shoes.

Today, when there is an ever growing tendency to locate cement plants immediately adjacent to cities or even within cities, the need for effective dust collection is of added importance. A clean plant, with tidy yards and grounds will do much to overcome the belief that is still prevalent that cement plants are nuisances.

From every point of view, a clean, dustless plant is desirable. It would not be amiss to award a trophy each year to the plant that would win in a cleanliness competition. If such a competition would arouse even a portion of the interest among workers that the safety trophy has, it would transform the appearance of many cement plants. And it would have favorable publicity value, also.

Cement Salesmanship

SELLING cement is becoming an increasingly difficult problem. No longer are sales made primarily on the basis of good will or personal acquaintance. Cement selling has become a technical problem. Salesmen must have a fairly complete knowledge of the manufacture of cement so that they may be able to advance the sales arguments of their brand and refute the claims of their competitors.

In this buyer's market, the purchaser of cement has become more "choosey." He can secure deliveries from any mill he selects. He buys now on a comparative basis, selecting a certain brand of cement rather than just cement.

The salesman must meet that changing attitude and be prepared to sell his product under those conditions if he is to succeed.

Fatal Accidents

THERE is food for thought in the abstract of Mr. Weitknecht's paper, read before the recent meeting of the National Safety Council. Much the same thought was expressed in Jack Dempster's paper, published in the previous issue.

Both of these papers comment on the increasing number of fatal accidents during 1928 and the first part of 1929. Even though the total number of accidents is decreased and the number of records made grows by leaps and bounds, the greater number of fatalities incurred dulls the edge of the enthusiasm the industry may feel.

Tremendous strides have been made, but there is danger of becoming complacent; of feeling that the job has already been accomplished. Until there has been a "no-fatality year," as Mr. Weitknecht suggests, there is still a big job ahead in accident prevention.

Effect of Temperature on Cement

By A. C. BLACKALL

Voluminous matter has been written on the effects of temperature on the setting time and strengths of cement and concrete, but the experimental results obtained have presented a number of discrepancies. The Building Research Station of the Department of Scientific and Industrial Research (British Board of Trade) has accordingly experienced difficulties in dealing with numerous inquiries received for information on these matters, and with the object of condensing the available data and, so far as possible, reconciling them, Dr. W. N. Thomas has subjected them to an exhaustive critical survey and N. Davey has carried out important experimental work regarding a number of disputed points. A report has just been issued containing the results of this investigation, which should attract widespread attention. It does not deal with the use of accelerators, such as calcium chloride, nor with temperatures high enough to affect the fire-resistance properties of materials.

The dependence of setting times upon temperature may be of considerable importance in temperate climates, but it is especially so when cement is used in a tropical or in a cold climate. With regard to portland cement, the result of a considerable amount of experimental work carried out by different investigators tends to concur to the extent that invariably the setting time, both initial and final, is increased when the temperature is reduced, and decreased when it is above the normal. The extent of these variations depends on the amount of mixing water, and may be very different with different brands of cement. Apparently there is no direct connection between actual setting times and the variations of those times with temperature. Thus the setting times of two cements may be the same at, say, 16 degrees C., and yet be widely different at 3 degrees C. With rapid-hardening portland cement, on the other hand, not only were the variations produced by differences of temperature sometimes found to be substantially wider than with ordinary portland cement, but in a number of cases a reduction of temperature decreased the setting time to a considerable extent, at least in the initial setting time. In experiments conducted by Mr. Davey on seven kinds of rapid-hardening portland cement the effects on the initial setting time ranged from a decrease of 73 per cent to an increase of 217 per cent, and the decrease with reduced temperature appeared in three specimens. With the final setting time, on the other hand, only one specimen, a foreign make, registered a decrease.

With aluminous cement there is considerable evolution of heat during setting, and probably therefore the setting time, especially for final tests, depends to a greater extent on the mass of the test piece than with portland cement. The results of different investigators on different cements vary considerably, especially in initial setting time. Results obtained by the Building Research Board on three cements tested under identical conditions showed that as between 16 degrees C., and 2 degrees C., no difference, or even trifling decrease, appeared in the initial setting time at the lower temperature, while in the final setting time there was an increase varying from a trifling amount, or even a slight decrease, to an increase of 6.8 per cent per degree C. The setting times of other cements, such as blast-furnace cement, appeared to be increased when the temperature of mixing was below normal, in much the same way as with portland cement.

The greatest amount of work has been done on the effect of temperature upon the strength of cements, concretes, and mortars. In this connection it is a pity that many of the published results do not give all the essential conditions of experiment, and in many cases it is impossible to say whether results are due to the variation of temperature or that of other circumstances. On first consideration it would appear that temperatures higher than the normal, by hastening the chemical and physical action of setting and hardening, should give higher strength, but, on the other hand, the more rapid change involves the likelihood of internal stresses. With air-cured specimens, again, variations in moisture contents may cause wide discrepancies and induce severe shrinkage stresses. Both these influences will appreciably counteract any increased strength that might be derived from the increased intensity of the chemical action at the higher temperatures. Many other variables may also affect the results, such as the proportion of the mix, the nature of the aggregate, the quantity of water used in mixing, the bulk of the specimen, as affecting the rate of cooling and heating, the temperatures of curing, and generally other conditions of curing such as air humidity and facilities for evaporation. When, moreover, water or concrete is taken below freezing point, other complications are introduced.

The facts to which special attention is called may be stated shortly. Low temperatures generally tend to retard the setting and hardening of portland cement to an extent that varies with circumstances and with the cement, and thus the special advantages of a rapid-hardening variety may either be retained or be lost at low temperatures. Before any inference is drawn regarding a particular cement it should, therefore, be tested under conditions similar to those in which it is likely to be used in practice. Both portland and aluminous cement work may be damaged seriously by frost and may be unable to recover fully when thawed. It has indeed been suggested that, if the period of frost be neglected, the curing may be assumed to be normal over the remainder of the time, but experiment has not confirmed this suggestion. Finally, bulk work in aluminous cement may be affected by high temperatures. As to the numerous detailed observations that have been made, it must be remembered that in most cases it is not possible to generalize from the result beyond the particular specimen of cement used in the experiment.

Middle West Shipments Show Decided Increases

The Kansas City Cement Bureau, serving Arkansas, Kansas, Western Missouri, Nebraska, Oklahoma and the Texas Panhandle, reports that the mills located in this territory shipped into same during the third quarter of 1929 a total of 3,605,224 barrels of portland cement, as compared with 2,723,223 barrels during the third quarter of 1928.

These mills shipped into the above territory during the first nine months of 1929 a total of 7,717,856 barrels of portland cement, as compared with 6,741,377 barrels during the first nine months of 1928.

At the end of September, 1929, these mills had in stock 820,743 barrels of finished portland cement, as compared with 1,169,210 at the end of September, 1928; and had unshipped commitments on contracts for specific work in the above territory approximately 1,496,997 barrels of portland cement, as compared with approximately 874,496 barrels in 1928.

Statistics indicate that the values stated in building permits issued in the larger cities of the above territory during the third quarter of 1929 were more than five and a half million dollars in excess of the same period of 1928.

What an Association *Can* Do

Sometimes it is beneficial to look around and to consider the activities of other industries. They may have gone further than we have in some respects.

Cement manufacturers point with pride to their co-operative activities. They have accomplished much along some lines. Even so, there may be some points brought out in the following address delivered by Alfred Reeves of the National Automobile Chamber of Commerce before a recent convention of the Associated Business Papers that would be helpful in planning enlarged future co-operative activities.

WE have proven that co-operation pays. By "co-operation" I mean give and take, but I don't mean give one and take ten. The theory of co-operation that means to get the other fellow to do what you want him to do is a co-operation of a character that can't continue. It's got to be some give and take all along the line. These manufacturers have done this to an extent that I think is outstanding in the industry.

For example, in doing this work we have made many mistakes. We have made a lot of mistakes. We made one this year when we tried to make a whole year's supply of cars in nine months, and we are suffering from it. But in general we don't make the same mistake twice.

The automobile manufacturers have never made the mistake of failing to recognize the importance of a healthy, sound market. We can't get these automobile manufacturers to sit around and say, "Let's curtail production." They never say that. They will sit around and say, "Reeves, how are we going to market another million cars next year? Where are we going to get these new markets for this increased capacity?"

These men are making 50 per cent more cars this year than they made last year with the same amount of stone-masonry and machinery—just an increased efficiency in the making of the product, and that comes from working together. They work together because they have found it pays and no concern is too big to benefit from a trade association and no concern is too small, provided they will go into it with the right spirit.

We go down to Washington, headed by Mr. Chapin. We say to Mr. Coolidge, "We want to bring over the International Road Congress to this country. There are four hundred of them. If we bring them over here, they will have to be invited by the United States government and you will have to put up about twenty-five thousand dollars to take care of them in Washington. We will spend two hundred thousand dollars taking them all over this country in buses to show them what highway transportation means to a country. They will be representatives of fifty-four countries. Mr. Coolidge, we think it's a great thing."

Of course even Cal could figure a good percentage there—twenty-five thousand; two hundred thousand. That sounded all right and he said he'd do it. And he did. And it has gone through and next October, under special steamship rates, we will bring over three or four hundred delegates of the International Road Congress representing fifty-four different countries.

That couldn't possibly have been done by any one automobile company, of course.

Everybody Talks Automobile Language

The same applies to legislation and general promotion and all things of that kind. They all contribute and of course, on the other hand, I don't overlook the fact that the motor car has a great advantage. It has a great advantage because it is an article of universal desire. Everybody wants it. And the further fact that everybody talks the automobile language.

A friend of mine went to the dentist here not long ago and as he lay back in the chair the dentist looked at him and said, "I'm afraid I'll have to remove a tooth. Will you have gas?"

The fellow looked up and said, "Yes, and I think you'd better raise the bonnet and see if I don't need a little oil."

It's automobile language. They just can't help it.

I remember the two girls they tell me about in Chicago here; I think they were in the Harvester Company's office. One was looking the other over and she said, "Dearie, how short do you think I ought to wear my skirt?"

The other looked at her a moment and said, "Well, Mabel, let your chassis be your guide."

That's automobile language!

Pooling Patents

What are a few of the things that the motor car manufacturers' organization is paid to do? In the first place, we have what is known as a cross-licensing patents agreement by which the manufacturers put in the patents they own and receive licenses under the patents that others own. There are seven hundred patents in that pool, and there hasn't been a patent law suit among the members for fifteen years, and any good, legitimate manufacturer can go into that pool, contribute what he has, get what everybody else has and make the best car that the known art permits.

What has that done? It has given to the public the best possible kind of cars that were available, and competition has been in the manufacturing of the car at a low cost and its distribution in an efficient way. That has been so good that after running for ten years they renewed it for another five and we now are renewing it for another five year extension. The first signature to the document that came in came from Mr. Sloane, the president of General Motors, who said he was going to Europe and he wanted to be the first to file this document with the National Automobile Chamber of Commerce.

We have one hundred and twenty-two standards on motor cars that make for lower cost. It is estimated that they save fifteen per cent on the list price of the motor car. That is why you are getting cars as cheap as you do get them.

We have a good many things in Washington and we are glad to print in the newspaper whatever we do at Washington. We went over the other day with nine company presidents—Edsel Ford, Nash, Sloane, Chapin, McCauley, Erskine—men who are the heads of biggest industrial manufacturing companies in our industry. Of course they were delighted to talk to us. Mr. Hoover and Mr. Lamont and Hyde and Stimson and the rest of them heard our problems, we heard their problems, we had a very excellent understanding, gave a statement to the newspapers of what we were there for and came away, and it's going to be most helpful. You have no idea of the excellent things you can get out of Washington that will help every business and every trade!

Long Range Promotion

In the foreign field: We have promoted American business about as far as we dare go. We've got to get some more room before we put out very many more cars although it is rather interesting to note that there is still a chance because fifty-five per cent of all the cars in the country are in towns of ten thousand or less; they are not all in Chicago though sometimes I look out here and I judge there might be.

This work is now going on in foreign countries—whether it is our man in Peru and Chile getting reduction of tariffs; our man in India dealing with lower tariffs over there and getting the recognition of the motor car as a utility rather than as a luxury; a man lecturing today in Finland with moving pictures in the language of the country where he is talking and meeting with highway commissioners or whether it's a man going to China, where they come out on the boat to meet him because he is going to talk highway transportation. He isn't going to sell them anything. When he leaves them it has not cost them a cent.

We are broadcasting and have already covered fifty-four countries; we are broadcasting the importance of highway transportation to every country around the world. We don't care what cars they buy. We don't care if they buy English cars or French cars or German cars; we will take a chance of getting our share.

The manufacturers pay for that. All that work is supported by the manufacturers, based on their production, so that everybody pays his fair share and is supposed to get his fair share.

That work has gone on now for the last five years. Our difficulty is in training the men, not only in the industry but training the men in the languages.

Advertising Ethics

Advertising—we think it has been pretty fair; it has been pretty boastful. I think we have exhausted about all the adjectives in the dictionary during the last twelve months, but nevertheless it has been fair because there are fundamental ethics with respect to automobile advertising—five of them, laid down and you never saw any slap at four cylinder cars by six cylinder cars. They will tell you the six is the greatest in the world but never tell you not to buy the four.

Ethics are well laid down by our advertising managers and are very carefully followed. The result is while our advertising has been a little bit boastful, that is the enthusiasm of the advertising man for the new product. We have to admit that. On the whole it has been very helpful.

I think in our industry we had one of the squarest and broadest advertisements I ever read. The Ward Motor Company make electric trucks. They ran a page ad in the New York Times which said, "We think you ought to buy an electric truck for the following reasons: . . . We think you ought to buy a Ward electric truck because of the following reasons: . . . But if you don't buy a Ward electric truck, buy an electric truck from any one of our nine competitors, whose names and addresses are given in this advertisement."

That was a great, broad piece of copy and of course brought them tremendous results because the very reaction from a thing of that kind is, "Well, if they are as broad as that, we will go and see them first," and that is all anybody can ask.

General Motors says, "Keep your old car." That is helping business a lot, I don't mind telling you. But they don't say "only General Motors cars." They say, "Keep your old car." We talk about two car families—all these things that tend to make the business healthier and better. Each manufacturer has to have enterprise enough to get his share of the business.

Exchange Production Figures

Of course these manufacturers exchange their production figures. They never lie. You don't have to have any spies in the plants. Once a month they lay down and tell each other exactly what they have produced during the previous month and what they got for it. There is nothing unfair about that. It stops all these spies in the factories. If somebody wants to go through the factories, we are delighted to have them.

The other day Mr. McAniny, the president of the Hudson Company, was talking with a couple of rivals. They said, "We wonder how you've been getting out these cars this year on a production basis with so many colors."

Mr. McAniny said, "Come to the plant tomorrow and spend the day with me. I'll take you through and show you how it's all done."

A rival said to the Cadillac Company, "We can't get production. We'd like to come and see what you're doing." The president of Cadillac said, "Come on up and bring a couple of your engineers. We'll give you a factory luncheon and a factory cigar and if you survive those we will take you through the plant."

Here at one of our International Days someone stepped up to the Packard man and said, "I think you ought to know that a couple of engineers from the Mercedes plant in Germany are here. Is it all right to go through?"

He said, "Certainly. Over on the table there you'll find some pads and pencils in case you'd like to make any sketches of machinery while you're going through."

When I was over in Berlin the following year they thought that was the greatest piece of industrial hospitality they ever heard of.

Of course, if we hadn't co-operated in that kind of a way—and there are scores of things of that character I could tell you showing the good spirit between these manufacturers in working for the general good. General Motors don't go out and try to do something for themselves; they couldn't go to India and be invited to talk to fourteen hundred people with moving pictures in the Empire Theater because it would be thought they were trying to sell a General Motors Car, but a representative of the Chamber can do it and be well received. They are glad to know what he has. He shows them the films and when he leaves he hasn't asked them to buy a thing. We don't care what they buy.

We have found that has paid and paid very well, and if it hadn't worked well we wouldn't be putting the world on wheels today.

This export work of ours we expect will increase exports this year probably two hundred thousand cars. We want to export this year a million cars. We have made five million motor cars up to last Thursday, cars and trucks, and we will probably make another six hundred thousand before the year is out. That total is a million more motor vehicles than we made last year. It ought to take care of the public's needs fairly well.

Swiss Cement Market Confines Demand to Native Product

1928 Imports, 25,000 Barrels, Largely from Italy—Exports 5 Per Cent of Production to France—Imports Some French Natural Cement—No United States Product Has Entered Market

NEARLY all of the portland cement used in Switzerland is produced within the country. In twenty-two plants that form a Swiss syndicate of cement manufacturers, about 4,690,000 barrels of portland cement are produced annually, while the total capacity of the plants in question is said to be approximately 8,794,000 barrels a year, a recent consular report states. One plant outside of the syndicate, with an annual capacity of about 80,000 tons (469,040 barrels) is nearing completion, and it is understood that another plant of the same capacity owned by an independent concern, will soon be constructed.

In the year 1928, 236,971 barrels of portland cement, valued at $271,560, were exported from all of Switzerland, while total Swiss imports of portland cement in 1928 were only 24,185 barrels valued at $34,557. The bulk of the exports went to France, and the imports were chiefly from Italy. Considerable quantities of Roman or natural cement are imported into Switzerland from France, principally from the region near Grenoble. In 1928 Swiss imports of Roman cement were 31,924 barrels valued at $50,291, of which 31,772 barrels came from France.

No cement of any kind has so far been imported into Switzerland from the United States, and building contractors and cement dealers are inclined to believe that freight charges from the United States would make the cost of American cement too high for profitable importation.

The present price for ordinary portland cement of Swiss make is Frs. 675 ($130.87) per carload of 10 metric tons, delivered free on cars at Basel. Such cement has a resistance for pressure after 28 days of about 500 kilos per square centimeter, 735 lbs. per sq. in. (with normal mortar of 1 part cement to 3 parts sand). A higher grade Swiss portland cement, with a resistance of about 800 kilos per square centimeter, 1175 lbs. per sq. in., sells at Frs. 1,350 ($260.55) per carload of 10 tons delivered at Basel. The high grade cement is preferred by contractors because of its quick hardening properties.

To illustrate the difficulty which American cement encounters in entering the Swiss market, because of high transportation costs, the following calculation is given to show approximate freight and duty charges on 10 metric tons of cement.

Ocean freight from New York to Antwerp (At rate for cement of $0.50 per 100 kilos)	$ 50.00
Freight from Antwerp to Basel (At Frs. 2 per 100 kilos by rail)	38.60
	$ 88.60
Duty on 10 tons of cement (At Frs. 1,440 per 100 kilos)	27.00
Total	$115.60

It will be noted that this amount of $115.60, which does not include handling charges and inland freight in the United States, is almost as high as the price, Frs. 675 ($130.87) for ordinary Swiss portland cement, delivered in Basel. The calculated freight from Antwerp or Rotterdam to Basel might be reduced somewhat by shipments by Rhine barge for this part of the journey. Rhine transportation to and from Basel has made much progress in recent years, and although the upper Rhine itself has not yet been made navigable during periods of low water, cargoes can usually be carried over a lateral canal. Economies can often be effected by the use of the water route for shipments of heavy goods that are not subject to deterioration in transit. The freight rate on cement by Rhine barge from Rotterdam to Basel is Frs. 15 per metric ton which would amount to Frs. 150 or $28.95 for 10 metric tons.

It is important that cement to be imported conform to Swiss standards. While the requirements vary somewhat in different localities and according to the purpose for which cement is used, it is understood that a normal compact mortar of one part cement to three parts sand must have as a rule a tensile strength of 22 kilos per square centimeter after 28 days, and a compressive strength after 28 days of at least 260 kilos per square centimeter.

NEW BOOK

CHEMISTS' POCKET MANUAL (4th edition), published by the Chemical Publishing Company, Easton, Pa.

A practical handbook containing tables, formulas, calculations, information, physical and analytical methods for the use of chemists, chemical engineers, assayers, metallurgists, manufacturers, and students, by Richard K. Meade, M. S., chemical and industrial engineer. This book contains 533 pages, illustrated.

Finnish Production Cost Prohibits Exportation

The cement industry of Finland is relatively young, having its inception in 1914; although small quantities of cement were manufactured as early as 1877. The country's requirements during the period immediately prior to the war was 700,000 barrels a year, the Bureau of Foreign and Domestic Commerce of the Department of Commerce states. Since the war the large demand for building materials in general has resulted in a steady growth of the industry.

Two Finnish firms are the main manufacturers of cement. One of them ranks importantly in the general business of the country. In 1928 domestic production amounted to 1,570,000 barrels as compared with 1,228,000 barrels in 1927. Imports of cement for the year 1928 and 1927 were respectively 458,709 barrels and 320,853 barrels.

With the prospects for a huge demand for cement for road building purposes and with growing demands for materials to satisfy home building requirements, the future for the industry appears bright. A single important drawback, however, is the seeming inability to obtain foreign outlets for its product thus far; costs of production have not been reduced to a point sufficiently low to make exporting profitable.

Annual Production

Official statistics show that production in 1926 amounted to 964,533 barrels. According to unofficial figures, output in 1927 reached 1,228,000 and 1,570,000 barrels in 1928. Notwithstanding record production in 1928 local demand was so great as to make necessary increased imports. With the return to normal conditions in the building industry a slight overproduction in the cement industry is expected.

Imports

The following table shows imports of cement for the years 1925-1928 according to countries of origin, in barrels of 376 lbs.

Country	1925	1926	1927	1928
Denmark	31,761	129,127	135,605	200,936
Estonia	27,796	85,377	78,037	74,922
Germany	28,007	40,238	55,300	64,165
Norway			1,794	
Poland			31,191	11,585
Sweden		21,418	9,234	37,449
Other Countries	721	1,131	9,692	69,652
Total	88,285	277,291	320,853	458,709

Exports

In the following table cement exports are given according to countries of destination in barrels of 376 lbs.

Country	1925	1926	1927	1928
Argentina	14,927			
Brazil	33,918	10,501		
Latvia	12,042	5,570		1,999
Other Countries	2,351	293	498	346
Total	63,238	16,364	498	2,345

Russian Cement Exports Increase Under Soviet Encouragement

Russia does not import cement from other countries, but on the contrary an exporter of this product, exports from October 1, 1928, to May 31, 1929, amounting to 182,474 barrels, shipped to Greece, Egypt, Persia and Turkey, according to United States Department of Commerce. This is one of the products the export of which the Soviet government is endeavoring to stimulate, and in the markets mentioned, because sold at a lower price than competing brands, it is becoming a greater factor each year. Exports in the same period last year amounted to 183,758 barrels, a large increase over previous years.

Fort Collins Plant Out of Gas; Makes Annual Repairs

The Colorado Portland Cement plant northwest of Fort Collins, Colorado, closed down temporarily on November 1st. According to Superintendent Ira J. Dilts, it is the custom to shut down for about two months, usually January and February, to make annual repairs. This year, however, the local gas field supplying natural gas for fuel is weakened and the company requested not to use the supply until a new pipeline from Denver is completed, about January 1st.

The new line will bring gas from Amarillo, Texas, and the plant will probably reopen early in January.

The Cement Market in Holland

An agreement has been reached between the cement producers of Belgium, Holland and Germany with regard to the market in Holland. Two or three Belgian cement producers have not yet signified their assent but it is practically certain that they will also fall in line.

While the agreement is somewhat elastic it has been tentatively decided that Belgium and Germany are each to furnish 40 per cent of the cement marketed in Holland while the lone cement mill in Holland is allotted the remaining 20 per cent. The Dutch market absorbs approximately 800,000 tons of cement per year.

Cement Plant Near Pasadena Asked by Business Group

Los Angeles County supervisors have been requested to erect a cement plant in Antelope Valley, north of Pasadena, Calif., as a "county industry." A local business man suggested the plant and the proposal is indorsed by the Antelope Valley Chamber of Commerce.

The proposal is in effect a bid for the plant whose location the supervisors have under consideration and which is to be located near the contemplated San Gabriel dam.

Canada Cement Contracts for Self-Unloading Ship

The Canada Cement Company, Montreal, Canada, has awarded a contract for the building of a steamer equipped with a self-unloading device for the transportation of bulk cement. The new ship will be 263 by 43 by 20 ft. carrying about 2,500 tons and will be Diesel electrically equipped. A 10-inch Fuller-Kinyon pump will be used.

French Firm's Profits

Chaux et Ciments Portland du Haut-Rhin, at Mulhouse, France, report net profits for the past year of 1,688,648 francs ($337,729).

Bonus Plan Halts Accidents

Results of Bonus System Pay, Southwestern Portland Cement Company Finds—Plant Men Replace Executives on Safety Committee

By EMORY SMITH

First-Aid Miner, U. S. Bureau of Mines, Mine Safety Station, Berkeley, Calif.

THE Victorville cement plant of the Southwestern Portland Cement Company is located about one mile from the city of Victorville, Calif. Two transcontinental railway systems, the Atchison, Topeka & Santa Fe, and the Southern Pacific Railway, afford shipping facilities.

The plant is modern and well kept, as the officials, especially the higher operating officials, take pride in the appearance of the place. Dust has been practically eliminated by the installation of dust collectors and wet grinding. The plant has a rated capacity of 6,000 barrels of cement daily.

The quarries are located on the Mojave Desert about seven miles from Victorville and are reached by the Mojave Northern Railroad. The cement plant, quarries, and railroad are all owned and operated by the same company, which employs from 270 to 300 men in all operations. The plant has been in service since 1916. Machinery and equipment are modern, well guarded, and maintained in good condition. Electric power, purchased from the Southern Sierras Power Company, is used throughout the plant.

Initial Safety Work

This company has long been interested in safety and has for several years been trying to reduce the number of lost-time accidents. According to available records, the first safety committee was organized in 1921, and the first committee meeting was held on September 15th of that year. The original committee was composed exclusively of foremen and other company officials, and this policy of membership was followed for some years.

This safety committee, composed exclusively of company officials, had the advantage of being practically an executive body with the necessary authority to act without delay or interference but suffered the disadvantage of viewing the accident prevention work entirely from the executive angle. Moreover, when the safety committee is composed of officials only, it is likely to give rise to the attitude among the workingmen that safety is a matter of concern to officials only.

Working Men Constitute Safety Committee

The disadvantages of the system so far outweighed the advantages that in March, 1928, it was superseded by the present method of selecting the members of the safety committee from among the workingmen about the plant. One man, with the consent of his foreman, is now chosen from each of the 16 departments of the plant and serves for six months on the safety committee without extra pay. In order always to have experienced men at the meetings, the periods of service are so arranged that half of the committee changes membership every three months. While foremen and other officials may attend safety meetings and make suggestions, they are not allowed to serve on the safety committee. Meetings are held on the last Friday of each month and the minutes are sent to the superintendent's office for consideration at the regular foremen's meeting on the following morning.

One man is selected from the safety committee to act as a safety inspector about the plant. Each department is represented by one member of the committee, and each member is supposed to pay particular attention to his own department, with which he is familiar, and immediately correct or report to his foreman any condition or practice which he may regard as unsafe.

Records Kept

Records of the original safety committee meeting of September 15th, 1921, and all subsequent monthly meetings have been typed and filed in a loose-leaf ledger; this complete set of minutes is open for inspection of every employee of the company. Examination of this interesting record of activities shows to what extent the company supported the committee. To April, 1929, the record shows that 128 recommendations were submitted by the committee, and of these, 122 were carried out in all respects, five were partially completed, and only one rejected. These recommendations covered practically everything under safety and welfare, from broken rails in the yard track to broken dishes in the boarding house.

In spite of all efforts, however, the accident record did not react in the manner in which the company officials believed it should, and it was decided to supplement other activities with a bonus system. In order to make a fair system the men were arranged in ten "teams," so grouped as to equalize the hazard as far as possible. From 25 to 30 men compose a "team" and any team completing a month without lost time due to an industrial accident is given a bonus of one per cent of their monthly pay. In case an accident occurs, however, the "team" of which the victim is a member does not receive a bonus for any month during which the accident causes a loss of time.

Effects of Bonus System

The result of the bonus system was both surprising and gratifying from the start. Since it was inaugurated in May, 1928, only two teams have failed to receive a bonus for every month, and for 12 consecutive months there has not been a lost-time accident and no time has been lost due to previous accidents. On the following page is shown a list of months showing the number of hours lost per 1,000 man hours worked since January, 1925.

It is quite generally believed by both men and management that the bonus system is responsible for this reduction of accidents, as prior to the introduction of the bonus there had been only one month free from lost time in 12 years of operation.

Costs of the bonus could not be compared directly to costs of hospitalization, compensation, etc., but the following excerpt from a letter written by the chairman of the safety committee would indicate that the cost of the bonus system is considerably less than the cost of accidents:

Reprinted from U. S. Bureau of Mines Information Circular No. 6176.

"The average cost of safety is approximately one-third of what increased insurance would be, did we not have our present safety activities, training, education, guards, etc."

Extensive use is made of the bulletin board and interesting pictorial news is shown in addition to the regular safety posters, in order to attract wider and more favorable attention.

Hours of Lost Time Per 1,000 *Man Hours Worked Since January,* 1925

	1925	1926	1927	1928	1929
January	4.075	1.767	2.745	None	None
February	3.927	6.298	4.940	0.129	None
March	4.713	4.102	6.950	3.409	None
April	4.706	5.581	12.047	4.109	None
May	4.457	3.490	5.650	4.132*	None
June	3.437	3.498	4.880	3.480	None
July	9.623	7.899	0.139	2.254	None
August	6.490	4.343	2.730	None	------
September	3.722	3.622	5.690	None	------
October	7.924	4.651	8.740	None	------
November	5.448	5.132	2.750	None	------
December	4.388	11.400	3.094	None	------

*Bonus system started May, 1928.

At the beginning of the present year a bulletin board was erected to show lost-time accidents, the department suffering the accident, and the month in which the accident occurred. On this board is painted the outline of a flag which is divided into 12 columns, each of the columns containing 16 blocks. The 12 columns correspond to the 12 months of the year, and each of the blocks represents one of the 16 departments of the plant. A cross is outlined at the center of the flag and the whole is painted a neutral color. At the end of each month the monthly column is painted and a color scheme is followed which at the end of the year will have the board painted with a green field and a white cross of the "no-accident" flag of the Portland Cement Association. However, should a lost-time accident occur, the block representing the department in which it occurred will be painted red for each month during which there is lost time.

That those in charge of this plant are making effective their efforts and methods toward prevention of accidents is very well shown in the foregoing tabulation which indicates that starting with August, 1928, this entire plant, employing upwards of 250 men, did not have a lost-time accident up to and including July, 1929—a full 12 month period.

While the month by month record as to hours lost time by accidents per 1,000 man hours worked, shown in the tabulation, indicates that for the years 1925, 1926, 1927, and the first half of 1928, the record was uniformly good, nevertheless the ultimate goal of no lost-time accidents was not reached until August, 1928.

An inspection of the table almost forces the conclusion that the institution of the bonus system in May, 1928, was the final refinement in the accident prevention practices of this plant which "put over" the no-lost-time accident program; 4.132 hours lost per 1,000 man hours worked in May, 1928, the month of the institution of the bonus system, was not far from the general month by month average of the three previous years; yet on the second month the bonus was in effect, the number of hours lost by accident per 1,000 man hours worked dropped to 3.480, in the next month it dropped to 2.254, and in every succeeding month (from July, 1928, to August, 1929), the plant worked without lost-time accidents.

Possibly with the bonus system credit should also be given the change from the all-official safety committee system to the all-employee safety committee system made effective in March, 1928. In any event the excellent record of 12 months without a lost-time accident, in a plant involving the utilization of the services of 270 to 300 men, could be accomplished only through the combined effort not only of the safety committees and of each and every one of the individual workers of the plant, but also of the intelligent, sympathetic co-operation and direct supervision of the employers' representatives.

Accident Figures Rise. Why?

By **W. H. WEITKNECHT**

Superintendent, Lehigh Portland Cement Co., Mitchell, Ind.

Check-Up Shows Increase in Fatality and Permanent Disability Record for 1928

THE total number of lost-time accidents reported by the cement industry for the years 1920 to 1924 inclusive are as follows: for 1920—2,615; for 1921—2,646; for 1922—2,572; for 1923—3,197; for 1924—3,058. For the years 1925 to 1928 inclusive the report is as follows: for 1925—2,602; for 1926—2,221; for 1927—1,379; for 1928—913.

During the latter four years the total actual number of days lost from accidents were as follows:

48,565 during the year 1925.
44,181 during the year 1926.
32,490 during the year 1927.
27,989 during the year 1928.

The number of fatal accidents decreased as follows:

In 1925—61 fatalities occurred.
In 1926—45 fatalities occurred.
In 1927—30 fatalities occurred.
In 1928—33 fatalities occurred.

The permanent disabilities record the high figure of 83 in 1923, followed by 76 in 1924, 78 in 1925, 67 in 1926, 67 in 1927 and 74 in 1928.

It will be observed from these figures that the reduction in the number of fatal accidents is fairly comparable with the reduction in the actual number of days lost. The reduction in the total number of disabilities, however, is not as favorable, while the average number of days lost per accident increased as follows:

In 1925 average number of days lost per accident was 18.6.

In 1926 average number of days lost per accident was 19.9.

In 1927 average number of days lost per accident was 23.5

In 1928 average number of days lost per accident was 30.7.

The foregoing figures apparently indicate a distinct improvement in accident prevention work in the cement industry during the last four years. We have accomplished a great deal, as the records tend to prove, but I question whether the bare record alone tells the correct story. There are indications that it does not.

I think it will be admitted without question that the Portland Cement Association's annual "Trophy Award" for the best accident prevention record in the industry has produced a greater interest and has brought about a larger reduction in the number of lost-time accidents than any other one thing. This interest, amounting to competition among the operating organizations, has likewise challenged the attention of most of the executives in the industry, and has, therefore, become the most important factor in establishing accident prevention work in the industry on its present sound basis. Certainly a worth-while accomplishment.

But we cannot measure the effectiveness of this accident prevention work by the reduction in the number of lost-time accidents, for prior to this intense competitive interest there was a great deal of time charged to lost-time accidents when, in reality, an accident resulting in a very minor injury furnished the basis for a brief vacation to the employee so injured. These vacation periods previously charged to lost-time accidents have, in most operating organizations, disappeared, and a lost time accident now is legitimately a lost-time accident. There is even danger that in our enthusiasm to establish a record we may step a little across the line on the other side. The real measure of accident prevention work is the reduction in fatalities and in the serious personal injury accidents resulting in permanent disabilities or long periods of temporary disability. After all, it is not the occasional no accident record that counts but the permanent improvement.

The fatality and permanent disability record for 1928 shows an increase in both classes from the preceding year, notwithstanding the reduction in man hours worked from approximately 93,800,000 to 85,800,000 man hours.

I do not believe that the increase in the number of serious and fatal injuries which occurred in the cement industry during 1928 and those which have thus far occurred during 1929 indicate a general reaction or slump following a period of intensive accident prevention effort, but rather that the much smaller number of these accidents during the year 1927 and the but slightly increased number for the year 1928 was coincidental with and not the result of that effort. The much larger number of fatalities thus far reported for 1929 when, during the same period, the number of plants reporting no lost-time accidents to date is larger than ever, tends to confirm the belief already expressed.

Nor do I believe that the years 1927 and 1928 record the best results that may reasonably be expected in the cement industry.

I believe, and am bold enough to go on record here and now to predict, that the cement industry will some day celebrate a no fatality year, for the analysis of the 1928 fatal accident reports clearly indicate, if it doesn't actually prove, that this possibility should have been a near reality for last year, so far as preventable, reasonably preventable accidents, were concerned; if the supervisory management, that is, the operating management from general manager and superintendent to the department foreman and sub-foreman, had been as competent and as efficient in their supervision of method and practice as they reasonably ought to have been.

It is seldom that the real cause of the accident is given in the reports. In most cases it must be inferred from very incomplete descriptions of the accidents, and the inferences which follow are only suggestive, and cover but a few of the inquiries and suggestions that might be made from the nature of the different accidents as reported.

Alpha Plant in West Virginia Reopens

The Manheim, W. Va., plant of the Alpha Portland Cement Company resumed operation in all departments on November 1st.

According to present plans the plant will operate until the Christmas holidays, and the shutdown at that time will be of short duration.

Australian Cement Merger to Be Effected

An agreement to amalgamate was reached recently by Australian Cement Ltd., whose works are near Geelong, Victoria, Australia, and the Kandos Cement Co., Ltd., with works at Kandos, New South Wales. Meetings of the shareholders of both companies have been held, at which resolutions were passed authorizing the action. At the Australian Cement Company's meeting, W. B. McCann, general manager and acting chairman of directors, said that the directors had carefully considered their position, which had been brought about by the over production of cement in Australia. As over-production was highest in New South Wales, the Australian Cement, Ltd., was open to attack by the combined forces of that state. The Kandos company has for some time been second only to the Australian Cement Limited in supplying the Victorian market, but its profits were absorbed by freight and handling charges. The cement sold in Victoria by Kandos will be supplied from Geelong, thus eliminating freight charges.

A new company will be formed, to which all the assets mentioned in the agreement would be transferred. This company will be registered in Melbourne as head office. The board of directors will consist of an equal number of directors of each of the amalgamating companies.

In Sydney, A. A. Stewart, chairman of directors of the Kandos company, in explaining the reasons for the move, said that it would benefit Kandos shareholders, inasmuch as the company would participate in earning power in two states instead of one, as at present.

Columbia Company Plant for San Diego, Calif.

The Columbia Cement Company has made local announcement of its $2,000,000 plant to be located at San Diego, near the naval destroyer base, on ocean frontage, to be completed within eight months. A budget of $500,000 for bulkheads and wharves has been set aside.

Plans are said to be under way for the establishment of a new fleet of three motorships which will make San Diego their home port. A conveyor system will be installed at the plant to load cement directly into the ships and ship service is planned from the plant to four Lower California ports, a new cotton port at the head of the Gulf of California, and a series of ports along the mainland.

New Finish Machinery for Lehigh Plant in Middle West

The Oglesby, Illinois, mill of the Lehigh Portland Cement Company, shut down on November 1st, for a period of sixty days to permit the installation of machinery in the finish department. Practically all employees will continue at work, however.

Atlas Buys Cuban Acreage for Plant

The Atlas Portland Cement Company has completed the purchase of a considerable area of ground near Havana, Cuba, upon which it expects to erect a cement plant.

It is reported that if the output is successfully placed, the company will also consider the erection of a plant on the other side of the island.

Steady Prices Feature of 1928 Swedish Cement Market

Production Estimated to Be Equal to That of 1927 — Exports Recover Ground Lost Year Ago — Imports Remain Unchanged

REMARKABLE stability was the keynote of the Swedish cement trade in 1928. Both the domestic price and the export value of Swedish cement remained without a single change throughout the year. While the mills appear to have been fairly busy meeting the marked increase in exports in addition to a comparatively satisfactory domestic demand, it is not thought that the volume of production increased appreciably over the preceding year. Imports of cement showed practically no change. Instrumental in a high degree toward this stability were undoubtedly the continued efforts of the manufacturers in the leading European cement-producing countries toward regulating both the overseas business and the trade between the various European countries, states a bulletin issued by the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

Swedish Production of Cement

Lacking definite information, the exact production of cement in Sweden during 1928 cannot be ascertained, but in initiated circles it is estimated that it did not materially exceed that of the preceding year. One of the principal reasons for this assumption is the closing down in 1928 of the works at Maltesholm. Although the activities of this factory are said to have been transferred to the Limhamn works, it is believed that neither this action nor the improvements at the Limhamn and Klagshamn works have fully compensated the closing of the Maltesholm factory, which produced 232,728 barrels of cement in 1927. This almost unchanged production in 1928 signifies a slowing down of the expansion shown during the preceding years, as observed from the following table:

Swedish Production of Cement in Barrels of 376 Lbs.

1924	2,385,132
1925	2,616,276
1926	2,763,695
1927	2,909,955
1928 (estimated)	2,950,000

Exports Showed Marked Recovery in 1928

Some of the ground lost by Sweden in the export market in 1927 was recovered in 1928, although the total quantity exported was considerably below that reported for 1926. Exports of cement during the last few calendar years have been as follows:

Swedish Exports of Cement in Barrels

1924	387,521
1925	803,120
1926	910,712
1927	740,456
1928 (preliminary)	807,836

Official statistics showing the destination of the cement exported from Sweden during 1928 will not become available until the first part of 1930.

Although the quantities shipped to the respective South American countries are not ascertainable, it may be assumed that Brazil and Argentina as in previous years continued to take the greater portion. In exporting circles it it said, however, that the exports of cement to the Baltic countries declined in 1928, due to the expansion of the domestic cement industries in those countries.

Shipments of Swedish cement to the United States during 1928, according to the declared exports records of the American consulates in Sweden, totaled only 87 barrels.

Exports to Argentina Regulated by International Agreement

In order to overcome the detrimental effect of the keen competition among European exporters of cement, an agreement is reported to have been signed toward the end of 1928 by important European cement exporters, establishing a definite quota for each country exporting cement to Argentina, as well as a minimum price. While this agreement was concluded in August, certain differences delayed its final acceptance until the beginning of December. As far as Sweden is concerned, the quota is reported to have been fixed at 12½ per cent of the total average annual exports of cement to Argentina during the last three years. The basic price agreed upon is 44 English shillings per 1,000 kilograms c. i. f. Buenos Aires, paid by 120 days date draft. The principal parties to the agreement are stated to be the three Scandinavian countries, Belgium, Germany and Italy.

Prices of Cement Showed Unparalleled Stability in 1928

Both the export and the domestic prices of Swedish cement showed unprecedented stability throughout 1928. Except for a slight decline in June in the price of barreled cement, due to cheaper barrels, not a single change was reported at any time of the year.

Imports of Cement Practically Unchanged

Imports of foreign cement into Sweden during 1928, 165,120 barrels, showed only a very slight increase over the 1927 figure of 160,941 barrels.

It is evident that considerable quantities of cement continued arriving in Sweden, despite the agreement concluded among several European countries in 1927 for the regulating of the European cement trade and the limiting of the imports into certain European countries. It is not improbable, however, that Polish cement, against which the measure was chiefly directed, has been replaced by increased imports from the Baltic countries. The reason why this cement can be imported in competition with the domestic product is the somewhat lower price at which it is sold.

A. S. T. M. Establishes Laboratory Equipment Tolerances

Proposed Apparatus Tolerances for Cement Testing Inspection Prepared by American Society for Testing Materials and Bureau of Standards

THE cement reference laboratory, established during the last fiscal year as a co-operative effort of Committee C-1 on Cement of the American Society for Testing Materials and the Bureau of Standards, to promote uniformity and improvement in cement testing, has been engaged for several months in field inspection of cement laboratories, according to the Bureau of Standards, Department of Commerce.

The inspectors may not visit some localities for considerable periods of time, and on that account the following tolerances on apparatus should be of interest to those laboratories which desire to examine and adjust their apparatus or write purchase specifications for new apparatus. It should be understood that these tolerances are "proposed tolerances" and have not at this time any official standing as accepted standards or tentative standards of the American Society for Testing Materials. However, the cement reference laboratory is operating under these tolerances.

Proposed Revisions in A. S. T. M. Standard Specification C 9-26. Proposed Tolerances on Apparatus

1. Insert at the end of section 35 the following:

"The Vicat apparatus shall meet the following requirements:

Weight of plunger, 300 g. (0.661 lbs.) ± 0.5 g. (± 8 grains).
Diameter of large end of plunger 1 cm. (0.394 in.) ± 0.02 mm. (0.001 in.).
Diameter of needle, 1 mm. (0.039 in.) ± 00.1 mm. (0.0005 in.).
Inside diameter of ring at bottom, 7 cm. (2.75 in.) ± 3 mm. (0.12 in.).
Inside diameter of ring at top, 6 cm. (2.36 in.) ± 3 mm. (0.12 in.).
Height of ring, 4 cm. (1.57 in.) ± 0.5 mm. (0.02 in.)."

2. Insert at the end of section 45 the following:

"The Gilmore needles shall meet the following requirements:

Initial needle—
  Weight, ¼ lb. (113.4 g.) ± 8 grains (0.5 g.).
  Diameter, ½ in. (2.11 mm.) ± 0.001 in. (0.02 mm.).
Final needle—
  Weight, 1 lb. (453.6 g.) ± 8 grains (0.5 g.).
  Diameter 1/24 in. (1.06 mm.) ± 0.001 in. (0.02 mm.)."

3. Replace subnote (3) of section 31, note 1, with the following:

"The balance used in making the fineness test shall meet the following requirements: The balance shall be inclosed in a glass case. On balances in use the tolerance to be allowed at a load of 50 g. shall be ± 0.05 g., and at loads less than 0.1 g. the tolerance shall be ± 0.01 g. (The tolerance to be allowed on new balances shall be one-half of the value given.) The maximum sensibility reciprocal allowable at each of the loads specified above shall be twice the value of the tolerance specified for the load in question. The sensibility reciprocal is a measure of the sensitivity of a balance and is the weight required to move the position of equilibrium of the beam, pan, pointer, or other indicating device of a scale a definite amount at the capacity or at any lesser load. For a complete definition of sensibility reciprocal see Bureau of Standards Handbook M85, pp. 80-82."

After subnote (5) insert an additional subnote, as follows:

"6. The tolerances to be allowed in excess or deficiency on the weights in use in the fineness test shall be as follows:

Weight	Tolerance	Weight	Tolerance
g	g	g	g
50	0.04	0.500	0.003
20	.02	.200	.002
10	.014	.100	.001
5	.010	.050	.001
2	.006	.020	.001
1	.004	.010	.001

"The tolerances to be allowed on new weights shall be one-half the values given."

4. Add to section 33 a note to read as follows:

"The scales used in weighing materials for neat cement and mortar mixes shall meet the following requirements: On scales in use the tolerance to be allowed at a load of 1.000 g. shall be ± 1.0 g. (The tolerance to be allowed on new scales shall be one-half of the values given.) The sensibility reciprocal (See note 1 [3] under Determination of Fineness) shall be not greater than twice the tolerance.

"The tolerance to be allowed in excess or deficiency on the weights in use in weighing materials for neat cement and mortar mixes shall be as follows:

Weight	Tolerance	Weight	Tolerance
g	g	g	g
1,000	0.5	20	0.05
500	.35	10	.04
200	.20	5	.03
100	.15	2	.02
50	.10	1	.01

"The tolerances to be allowed on new weights shall be one-half the values given."

5. Add to section 33 a note to read as follows:

"Glass graduates of 100 to 200 ml. capacities used for measuring the mixing water shall be made to deliver the indicated volume at 20 deg. C. (68 deg. F.). The tolerance to be allowed on these graduates shall be ± 1.0 ml."

6. Insert at the end of section 47 the following:

"The dimensions of the briquette molds shall meet the following requirements: Width of mold, between inside faces, at waist line of briquette, 1 in. ± 0.01 in.; thickness of mold 1 in. ± 0.004 in. The tolerances to be allowed on new molds shall be one-half the values given."

7. Amend section 52 as follows:

In place of portion commencing in line 3 with "The machine shall be capable . . ." and ending in line 8 with ". . . any lesser load," insert the following:

"The error for loads of not less than 100 lbs. shall not exceed ± 1.0 per cent for new machines or ± 1.5 per cent for used machines."

Also add to the last sentence of this same paragraph—"± 25 lbs. per minute."

8. Insert at the end of section 55 the following:

"The relative humidity of the moist closet shall not be less than 90 per cent."

9. Add the following note after section 28:

Note.—The balances used in the chemical analysis shall meet the following requirements: Capacity not less than 100 grams in each pan; the two arms of beam to be equal to within 1 part in 100,000; capable of reproducing results within 0.1 mg.; sensibility reciprocal (see note under Determination of Fineness) not more than 0.2 mg. per division of the graduated scale. The weights used in the chemical analysis shall conform to the requirements of the Bureau of Standards specifications for class "S" weights as contained in Bureau of Standards Circular 3.

Accidents in Quarrying Industry Reduced During 1928

A total of 119 employees were killed and 10,568 injured in the quarrying industry of the United States during the calendar year 1928, according to a statistical survey made by the United States Bureau of Mines, Department of Commerce. The death rate for the industry was reduced 10 per cent and the injury rate 20 per cent below the 1927 level, when 135 workers were killed and 13,459 injured.

In the quarrying industry 89,667 men were employed by 1,436 active operators. The number of men employed was 1,850 less than in the preceding year. A total of 24,397,377 man-days of labor was performed. The fatality rate per thousand 300-day workers was 1.46, while the injury rate was 129.95.

The quarrying of limestone required the services of the largest group of workers, 37,830, while cement rock quarries employed 22,315; granite, 11,314; marble, 6,777; trap rock, 3,908; sandstone and bluestone, 3,849; and slate, 3,674. The highest accident rates were in the traprock group, in which 9 fatalities and 591 injuries occurred, the fatality and injury rates being 3.13 and 205.78 per thousand 300-day workers, respectively. In the large group of limestone workers, 60 men were killed and 5,399 injured, the fatality and injury rates being 1.84 and 166.02. Of the cement rock workers, 25 were killed and 1,161 injured, the fatality and injury rates being 1.05 and 48.76.

Of the 119 deaths in the entire industry, 77 occurred in the quarries and 42 outside, while 6,297 injuries occurred in the quarries and 4,271 on the outside.

The greatest single cause of death in and about the quarries was falls or slides of rock or overburden, which accounted for 29 fatalities. Falls of persons caused 11 fatalities; machinery, 10; explosives, 9; haulage, 8; electricity, 3; handling rock at face, 2; flying objects, 2; drilling and channeling, 2; and boiler and air-tank explosions, 1. The largest single cause of all classes of injuries in and about quarries was handling rock at the face, which accounted for 1,400 accidents. In outside work, machinery was responsible for 9 fatal injuries, haulage and falls of persons for 8 each; burns for 6; electricity for 4; falling objects for 3; flying objects for 1, and other causes for 3.

The largest number of persons employed in the quarrying industry in any state was in Pennsylvania, with 15,291 workers. Ohio, with 6,610; Indiana, with 5,311; California with 4,896; New York, with 4,590, and Vermont, with 4,463 workers, followed in order. The largest number of deaths, 19, and injuries, 1,520, occurred in Pennsylvania.

$200,000 Deficit Lowers Alpha Earnings

The Alpha Portland Cement Company has recently reported a decline in earnings for the twelve months ended September 30th, earnings on common stock declining from $3.44 in 1928 to $2.60 in 1929.

In this period the company showed a net income of $1,989,345, on net sales of $12,373,664, equivalent to $2.60 a share on the common stock outstanding at 711,000 shares. After preferred and common dividends, a net deficit of $283,655 resulted. Sales have declined as compared with the calendar year 1928, when net sales were $13,546,627, on which the company showed a net income of $2,585,535.

In 1928 operating costs were reduced despite declining shipments, resulting in a 9.6 per cent expansion of net income over 1927 figures, but earnings a share were lower in the later period due to increased capitalization.

The Alpha Company's financial position is still rated as strong, with current assets approximately seven times current liabilities.

Cement Section of Safety Council Issues News-Letter

The first issue of the "Cement News-Letter," issued by the Cement Section of the National Safety Congress appeared in November. A tentative plan for the scope of the letter is submitted to readers for suggestion and criticism. Some of the subjects it is proposed to include are the achievements of various members, safety stunts used in the industry, questions and answers, personals, and reports of sectional activities, announcements and reports of regional meetings, etc.

The new officers of the Cement Section are also announced. E. H. Parry is general chairman.

Publication of the news-letter was decided upon by the Committee at the recent sessions of the Cement Section of the National Safety Council at Chicago, to be sent to the operating heads and safety directors of the plants and mills enrolled in the section.

Mason City, Iowa, Plants to Continue Through Winter

Both the Lehigh and the Northwestern States Portland Cement Company plants at Mason City, Iowa, will continue operation through the winter months.

The Northwestern plant will be operated continuously through to March 1st, following which there may be a short shutdown for repairs, and the addition of a new waste heat boiler.

The Northwestern States plant at Gilmore City, Iowa, closed for the winter months on October 23rd.

Power for Okay Plant

Increased electric power is now furnished to the Arkansas Portland Cement Company at Okay, Arkansas, following completion of twenty miles of 110,000 volt transmission line between Saratoga and McNeil, Ark.

MEN and MILLS

Notes from the Field

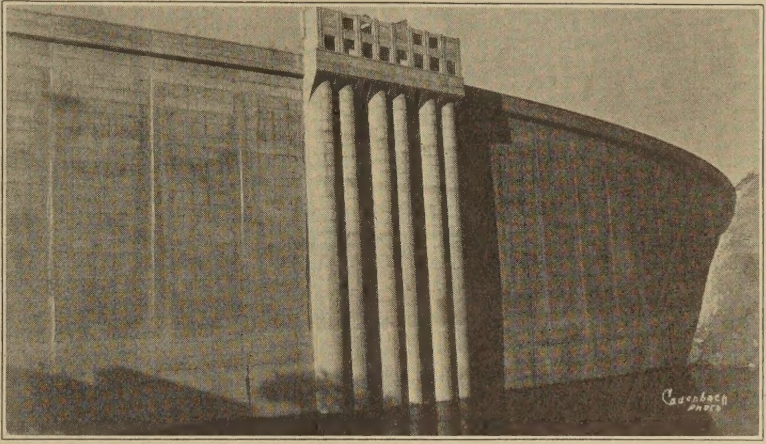
Calaveras Co-Operates in Dam Dedication

The Calaveras Cement Company, San Francisco, Calif., co-operated in the dedication on October 19 of the Pardee dam, completed recently at Valley Springs, Calif.

One of the outstanding features of the dam is that it was completed in less than half the contract time, the Calaveras company supplying the cement.

Thousands, including California's governor, state officials, and others, attended the dedication ceremonies.

Calaveras Cement Dam



The Pardee dam, at Valley Springs, Calif.

Anton Beier, Cement Plant Pioneer, Dies

The portland cement industry lost one of its old-timers when Anton F. Beier, died on Friday, October 11th, at his summer home at Seaside Heights, New Jersey. He had been retired for several years.

Mr. Beier came to Philadelphia from Austria when a boy and after working at a trade for a number of years, organized, together with the late John B. Stetson and the late William Krauss, the Monroe Portland Cement Company, at Nazareth, Pa. The latter is said to have been the first portland cement company in the country.

Chemists Inspect Fort Collins Plant

During the course of their annual meeting at Fort Collins, Colorado, the Colorado section of the American Chemical Society visited the Ideal Portland Cement Company plant near there.

W. G. Banks, chief chemist for Ideal, gave the principal address of the evening, on "Cement Manufacturing."

Lunch Time in a Kiln

Scene showing interior of a Pacific Coast Cement Company kiln during construction, at Seattle, Wash.

Volunteer Opens Doors for Factory Visitation Week

The Volunteer Portland Cement Company plant was one of the local industries holding "open house" during the factory visitation program at Knoxville, Tenn., the week of October 21st. The local Chamber of Commerce sponsored the program.

W. H. McCroskey, chairman, W. W. Rhea, J. W. Warren, Charles P. Biddle and H. G. Bonner served on the Volunteer reception committee.

Organizes Basketball Team at Lone Star Plant

One of the first of the local basketball teams is now being organized by Edward Dech of the Lone Star Cement Company plant at Nazareth, Pa.

The following plant men have already signed up with him: David Michael, Woodrow Dech, P. Kidd. Wm. Muth, Andy Nagle and P. Lindenmoyer.

Miner, Atlas Official, Dies

Wm. E. Miner, vice-president of the Atlas Portland Cement Company, died at his home at Shippan Point, Conn., on October 6th after a week's illness.

Mr. Miner had been connected with his organization for thirty years.

Cement Statistics for October

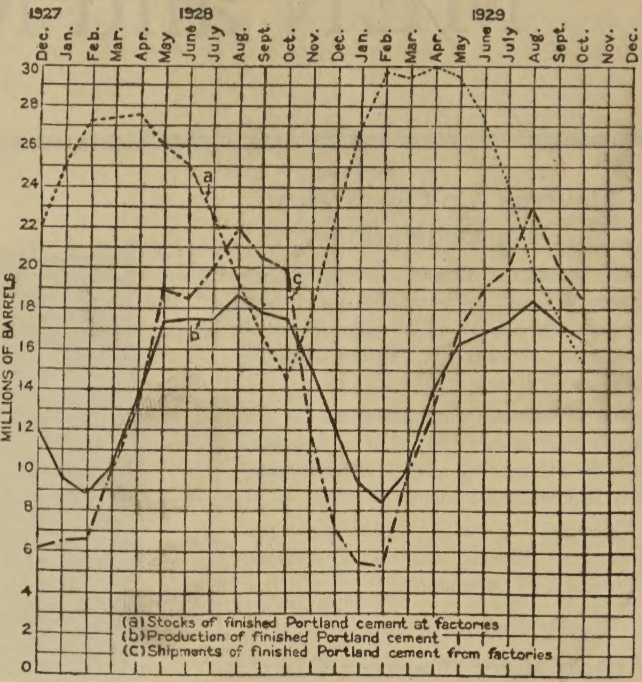
Production and Shipments in October Continued to Remain Below Those of 1928—Capacity Lower by 10 Per Cent

Relation of Production to Capacity

(Figures represent per cent)

	—October— 1928	—October— 1929	Sept. 1929	August 1929	July 1929
The month	**87.1**	77.0	81.8	86.1	80.4
The 12 months ended	**73.8**	67.3	67.5	68.2	68.9

	1928	1929	Increase or Decrease—Per Cent
Production, October	**17,533,000**	16,731,000	—4.6
Shipments, July	**19,836,000**	18,695,000	—6.8
Stocks at end of Oct.	14,579,000	**15,361,000**	5.4
Total production for year to date	**148,711,000**	144,914,000	—2.6
Total shipments for year to date	**156,120,000**	152,240,000	—2.5
No. of plants reporting	159	**165**	



Production, Shipments and Stocks of Finished Portland Cement, by Districts, in October, 1928 and 1929, and Stocks in September, 1929

District	Production—October 1928	Production—October 1929	Shipments—October 1928	Shipments—October 1929	Stocks at end of month 1928	Stocks at end of month 1929	Stocks at end of September 1929*
Eastern Pa., N. J., and Md.	**3,743,000**	3,571,000	**4,753,000**	4,043,000	**4,011,000**	3,980,000	4,452,000
New York and Maine	**1,204,000**	1,129,000	1,375,000	**1,407,000**	**1,102,000**	996,000	1,274,000
Ohio, Western Pa., and W. Va.	**2,120,000**	1,731,000	**2,294,000**	2,176,000	1,985,000	**2,240,000**	2,685,000
Michigan	**1,550,000**	1,437,000	**1,673,000**	1,323,000	757,000	**1,075,000**	961,000
Wis., Ill., Ind. and Ky.	**2,238,000**	1,935,000	**2,646,000**	2,346,000	924,000	**1,329,000**	1,740,000
Va., Tenn., Ala., Ga., Fla. and La.	**1,561,000**	1,306,000	**1,576,000**	1,419,000	**1,619,000**	1,498,000	1,610,000
Eastern Mo., Ia., Minn. and S. Dak.	1,599,000	**1,718,000**	1,705,000	**1,870,000**	**1,466,000**	1,273,000	1,426,000
W. Mo., Neb. Kans., Okla. and Ark.†	1,190,000	**1,331,000**	1,361,000	**1,508,000**	**993,000**	621,000	798,000
Texas	617,000	**777,000**	552,000	**743,000**	346,000	**527,000**	492,000
Colo., Mont., Utah, Wyo.† and Idaho†	199,000	**323,000**	282,000	**346,000**	304,000	**451,000**	475,000
California	1,177,000	**1,179,000**	**1,257,000**	1,183,000	687,000	**937,000**	941,000
Oregon and Washington	**335,000**	294,000	**362,000**	331,000	385,000	**434,000**	471,000
	17,533,000	16,731,000	**19,836,000**	18,695,000	14,579,000	**15,361,000**	17,325,000

Production, Shipments, and Stocks of Finished Portland Cement, by Months, in 1928 and 1929

Month	1928—Production	Production—1929	1928—Shipments	Shipments—1929	Stocks at end of month 1928	Stocks at end of month 1929
January	9,768,000	**9,881,000**	**6,541,000**	5,707,000	25,116,000	**26,797,000**
February	**8,797,000**	8,522,000	**6,563,000**	5,448,000	27,349,000	**29,870,000**
March	**10,223,000**	9,969,000	**10,135,000**	10,113,000	27,445,000	**29,724,000**
April	13,468,000	**13,750,000**	13,307,000	**13,325,000**	27,627,000	**30,151,000**
May	**17,308,000**	16,151,000	**18,986,000**	16,706,000	25,984,000	**29,624,000**
June	**17,497,000**	16,803,000	18,421,000	**18,949,000**	25,029,000	**27,457,000**
July	**17,474,000**	17,281,000	19,901,000	**20,295,000**	22,580,000	**24,525,000**
August	**18,759,000**	18,585,000	21,970,000	**23,052,000**	19,374,000	**20,056,000**
September	**17,884,000**	17,223,000	**20,460,000**	19,950,000	16,799,000	***17,325,000**
October	**17,533,000**	16,731,000	**19,836,000**	18,695,000	14,579,000	**15,361,000**
November	15,068,000	....	11,951,000	....	17,769,000	....
December	12,189,000	....	7,384,000	....	*22,918,000	....
	175,968,000	....	175,455,000	....	....	....

*Revised.

†The inclusion of Wyoming begins with April, 1929; of Idaho with June, 1929; of Arkansas with September, 1929.

Mill Equipment

A New D. C. Across the Line Starter

A new, automatic, across-the-line starter, for general applications, of direct current motors up to 2 hp., 115 or 230 volts, is announced by Cutler-Hammer, Inc., Milwaukee, Wis. Some new features incorporated in this design, according to the manufacturer, are: small size, low cost, double line break, thermal overload protection, low voltage protection, silver contacts, and completely enclosed structure. Two magnetic contactors, one in each side of the line, connect the motor directly across the line on starting and provide a double line break. The contactors are designed especially for direct current service. They have renewable silver contacts and a heavy stamped frame.

The thermal overload relays are the same as those used in this Company's A. C. across-the-line starters for small motors. They are the fusible alloy type and can be adapted to any size motor by simply changing heater coils. When tripped by an overload, the relays are reset by pushing a button in the cover.

Each starter is furnished with a pushbutton master switch providing three-wire control. This master switch can be furnished mounted in the cover of the starter, or it can be arranged for mounting separately. These starters are also made without the thermal overload relays, for applications where overhead protection is not required.

Westinghouse Develops New Dust-Tight Linestarter

The Westinghouse Electric & Manufacturing Company announces the development of dust-tight and weather proof linestarters. They are remote controlled, non-reversing, across-the-line type magnetic starters for single phase and polyphase squirrel-cage induction motors.

The starter differs from the other types in its cabinet construction in that a cast iron cabinet is used with a gasket seal on the door. The conduit is brought in through the top and bottom in threaded openings, so as to make a dust-tight connection. These features are said to make the cabinet dust-proof and water-proof.

All dust-tight linestarters are equipped with the deion grid type arc quencher.

To prevent the operator from breaking the seal whenever the motor is put back in service after an overload, the two smaller size linestarters are equipped with an automatic reset thermal overload relay. This relay has interchangeable heaters, an accessible calibration lever, and quick make and break contacts.

The dust-tight linestarter is now available in three sizes up to 50 horsepower.

New Switch Throws Motors Across the Line

A new magnetic switch, the CR-7006-D-30, is announced by the General Electric Company to supersede the CR-7006-D-4, and is designed primarily for throwing small motors directly across the line. It can, however, be used as a primary switch for slipring motors having secondary control. It is recommended for use with small motors wherever a simple, direct control, providing complete protection to motor and operator, is required.

The new switch incorporates all modern design principles from the standpoints of size, mechanical construction, appearance, electric ratings, etc. The enclosing case is of the drawn-shell type in which plenty of room is provided for wiring. The reset button for the overload relays extends through a hole through the cover, allowing its use without removing the cover. Practically all of the parts of the switch have been improved over those of the older D-4 form.

These changes include the use of a molded shaft which will not stick in the bearings, thermal overload relays with interchangeable heater units, silver contacts on the holding interlock, an E frame magnet which requires a minimum of power to operate it, and restricted type blowouts.

The horsepower ratings at various voltages for the standard squirrel-cage type of motor are as follows: 110 volts, 7½ horsepower; 220 volts, 15 horsepower; 440/600 volts, 15 horsepower. For straight starting duty where no jogging is encountered, the 15 horsepower rating on 440/600 volts can be increased to 20 horsepower.

Hascrome Welding Rod Is Self-Hardening Alloy

The Haynes Stellite Company of Kokomo, Indiana, has placed on the market a manganese-chrome-iron welding rod called Hascrome. This is a self-hardening alloy, designed primarily for building up badly worn parts preparatory to surfacing them with Haynes Stellite, which is also supplied in the form of welding rod. Since the cost of Hascrome is materially less than that of Haynes Stellite, the resulting composite surface is much cheaper than if entirely built up of the latter alloy. Hascrome may be used for building up large sections of steel or cast iron, and forms an excellent base for Stelliting because it is sufficiently hard to resist deformation under impact, and because of the ease with which Haynes Stellite flows into it. Although in some cases Hascrome alone may be used for hard-surfacing parts subject to abrasive wear, it does not possess red hardness to the same degree as Haynes Stellite, and it will wear away more rapidly. The new alloy is also being used for tacking Haystellite—the Haynes Stellite Company's diamond substitute—to the cutting and reaming edges of oil well drilling tools.

The oxy-acetylene process is considered best for the application of Hascrome, since the hardness of the deposited metal can be controlled by the amount of excess acetylene used in the welding flame, as well as by the rate of cooling. The greater the excess of acetylene in the flame and the slower the cooling rate, the harder the deposit will be. When quenched, the metal becomes softer and tougher. Hascrome is applied to steel without puddling the steel. Best results are obtained when the deposit is made just so the steel surface is at a "sweating" heat.

INDUSTRIAL LITERATURE

New Buckeye Catalog

An attractive, 24 page catalog describing their new vertical Diesel engine has been issued by the *Buckeye Machine Company*, of Lima, Ohio.

The engines illustrated and described are of the four cycle type.

Dixie Mogul Equipment

A recent publication of the *Dixie Machinery Manufacturing Company*, St. Louis, Missouri, concerns its *Mogul* non-clog hammermill. Specifications, reproductions of installations, diagrammatic illustrations of installations and of various models, are contained in it.

With the Manufacturers

INDUSTRIAL LITERATURE

Quigley Cement

Booklet A. P. 122 published by the *Quigley Furnace Specialties Company*, New York, tells about Quigley Acid-proof cement, for use on masonry where hot or cold acid gases are handled or moist acid conditions occur.

The Quigley product is described as a ready-mixed acid resisting cement having properly balanced ingredients. The contents include, in addition to an outline of the properties, a list of structures in which it is used, instructions on laying brick and tile, how to test the joint for dryness, and patching and repairing.

Nikrome Alloy Steel

A four-page folder prepared by *Joseph T. Ryerson & Son, Inc.*, Chicago, describes *"Nikrome,"* a heat-treated alloy steel of guaranteed physical properties.

It is said to be especially suitable for places where ordinary steel will not hold up, and is in stock in finished heat-treated conditions ready to use so that no further work of any kind is necessary.

C-E Condensed Catalog

A new 16-page catalog illustrates and briefly describes the more important fuel-burning and steam-generating equipment manufactured by *Combustion Engineering Corporation*, New York. A complete list of C-E products is shown on page 16.

Kiln Lining Records

Three hot zone lining records are outlined in a 4-page folder prepared by the *General Refractories Company*, Philadelphia, Pa. All concern the *Arcofrax* linings installed in the three kilns of a western cement plant.

Allis-Chalmers Publication

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has prepared and is now distributing a 92-page publication on modern rock crushing plants, prepared in the Spanish language.

Amsco Bulletin

"The Amsco Bulletin" is the new name of the *American Manganese Steel Company* eight-page publication appearing from time to time.

It describes a number of interesting installations of Amsco products, record size units, and outlines briefly some of the properties of the numerous grades of Fahralloy, heat and corrosion resistant metal.

Motor Problems

Dust, fume and moisture problems requiring special protection to motor and property are discussed in a revision of *Bulletin* 151 published by the *Wagner Electric Corporation*, St. Louis, Mo., and now distributed following its third revision.

The bulletin points out the construction features reputed to make Wagner air-jacketed motors dust-proof, fume-proof and moisture-proof.

Loose Leaflets

Three new loose-leaf publications received from the *General Electric Company*, Schenectady, N. Y., are those on magnetic switches for alternating-current motors, synchronous motors for pumping, and enclosed magnetic reversing switches.

Chain Grate Stoker Catalog

A new catalog describing and illustrating the Green natural draft chain grate stoker is being distributed by the *Combustion Engineering Corporation*, New York City.

Among the features of this catalog are the tables on page 24 which show three typical evaporative tests, and drawings on pages 21, 22 and 23 which show applications of this stoker to various types of boilers.

Green stokers are said to burn the screenings from all grades of non-coking or moderately coking bituminous coals, high-ash coals and many lignites.

Chemical Bibliography Supplement Now Available

The National Research Council announces the publication of its Bulletin No. 71 which is the first supplement to the Bibliography of Bibliographies on Chemistry and Chemical Technology covering principally the period 1924-1928, Bulletin No. 50 having covered the period 1900-1924. This supplement contains approximately 4,100 bibliographies classified under 1,050 headings. The original bulletin (No. 50) contained approximately 10,000 bibliographies classified under 2,400 headings.

As the title indicates, the work (as in the case of Bulletin No. 50) is a compilation of bibliographies published as separates, or at the end of books or magazine articles, or as footnotes to the same, on the numerous aspects of pure and applied chemistry. Each entry gives name of author or compiler, title, and place of publication. The majority of the entries state the number of references, thus giving an indication of the completeness of the particular bibliography. The entries are classified under the proper subject-headings, alphabetically arranged. The duplication of individual entries has been largely avoided by the liberal use of cross references.

There are 21 references on cement, 31 on coal, 55 on colloids, 25 on mineral resources.

Copies of Bulletin No. 71 may be obtained from the publication office, National Research Council, B and 21st streets, N. W., Washington, D. C.

NOTES FROM THE FIELD

Allis-Chalmers District Manager

A. D. Brown of the *Allis-Chalmers Mfg. Co.*, has been appointed district manager of the Buffalo, New York, office to succeed M. W. Phelps, resigned.

Mr. Brown was formerly associated with the Pittsburgh Transformer Co., New York office and during the past year has acted as special factory representative for the Pittsburgh Transformer Division of Allis-Chalmers Mfg. Co. with headquarters at Pittsburgh and New York. He assumed his new duties on November 1st.

Chain Belt in Boston

The Chain Belt Company, Milwaukee, has opened a New England district office in Boston at 950 Park Square Building. *J. K. Merwin* is district manager. The Boston office will manage the distribution of the company's entire line of conveying systems, power plant equipment, chains and transmission machinery.

Seattle Office for Combustion

Combustion Engineering Corporation announces the opening of a district office at Room 606, 1411 Fourth Avenue, Seattle, Wash. *George M. Bechtel*, recently of the Los Angeles office of Combustion Engineering Corporation, has been appointed branch manager.